A PHILOSOPHICAL

ESSAY ON MAN.

BEING

AN ATTEMPT

TO INVESTIGATE THE

PRINCIPLES AND LAWS

OF THE

RECIPROCAL INFLUENCE

OF THE

SOUL ON THE BODY.

by Marat

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PREFACE.

AMONG all the agreeable and intereſting ſciences, the moſt cultivated, and the leaſt improved, is certainly that of Man. How many ſyſtems have been invented! How many volumes written upon this ſubject! And what a multitude of abſurdities involve the few truths that have been publiſhed thereon!

Let us take a curſory view of the hiſtory of this part of human knowledge. Since men firſt entered on the ſtudy of nature, Man has been the particular object of their enquiries. A ſubject ſo noble and ſo intereſting, was too important not to engage their chief attention. But as they were deſtitute of every light, their knowledge of Man, as of the reſt of the univerſe, was confined to a few ſuperficial and imperfect obſervations. The firſt, who made Man their ſtudy, undoubtedly believed him to be wholly corporeal; and they who ſucceeded, rather gueſſed, than demonſtrated, that ſome other ſubſtance, beſides the body, entered into the compoſition of his being. Mankind had then made no curious diſquiſitions in ſcience; they knew but very little of things; and metaphyſical knowledge, then in its dawn, could not ſupply thoſe profound and ſubtil arguments, which ſome modern philoſophers have employed, to prove that Man is not wholly material. This profound ignorance of the firſt age was likewiſe the lot of the ſubſequent, and men, for a long time, only ſuſpected they poſſeſſed a ſoul, ſo far were they from being able to convince themſelves of its exiſtence, and ſo entirely ignorant of its nature. But let us paſs over thoſe dark and unknown ages, and deſcend to more enlightened times.

In Greece, that nurſery of the arts and ſciences, where the faculties of the mind were ſo amazingly improved in various branches of knowledge; philoſophers were continually diſcourſing of ſoul and ſpirit, but without annexing to theſe terms any idea of ſpirituality. The moſt diſtinguiſhed, as Ariſtotle, Socrates, Plato, Diogenes, Epicurus, agreed in affirming the ſoul to be a ſpirit; but this ſpirit was believed by all to be a thin ſubtil mat-

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ter. Thus, for want of accurate obſertions, philoſophers were ſtopped ſhort in their firſt attempt, and all their knowledge was confined, like that of the herd of mankind, to the diſtinguiſhing their own ſpecies from that of brutes, by the configuration of the body.

In proceſs of time, philoſophers made farther reſearches, but without rule, and without any principles to guide them: inſtead of previouſly examining what they were deſirous to know, they began with defining the matter of which they as yet had no idea; aſtoniſhed at the phenomena of the human mind, they repreſented Man rather after their own imagination, than after nature. Some doubted whether they ſhould not exalt him to the condition of a god; whilſt others were for degrading him to a ſtate inferior to the beaſts.

Time, which produces ſuch revolutions in opinions, wrought no great alteration; and the ſcience of Man, in paſſing from one country to another, carried all its errors along with it, without acquiring any new truth.

The Grecian philoſophers underſtood Man no better than their maſters, the Egyptians;

tians; nor were the acquirements of the Romans, in this ſcience, greater than thoſe of the Greeks, notwithſtanding the many fine things written by *Cicero*, *Seneca*, and others florid writers on this ſubject.

At firſt they knew not Man, and afterwards could not. Prieſts who, from a principle of ſelf intereſt, have ever made it their buſineſs to miſlead mankind, and, in the name of the Gods, to ſanctify ignorance and error, feigned many abſurd tales concerning Man, his geneſis, his nature, and the end of his creation. From that time, the chimeras of fable were intermixed with the feeble lights of philoſophy, already too much involved in error. And Man was believed to have been formed *after the image of the gods*, and *his ſoul* to be *a particle of the divine nature*. The age of ignorance was of very long duration. Darkneſs increaſed and fables were multiplied. Hence Man, thus bewildered and enſlaved to thoſe heavenly bugbears, had not even a deſire to know himſelf.

A ſhort time ſince, ſome philoſophers, aſhamed of ſo diſhonourable a ſervitude, tore off the bandage with which ſuperſtition had obſtructed their ſight, and turned their eyes inwards on themſelves. But, as the ſcience of Man was intricate and myſterious, to recover it from that darkneſs in which it was then involved, it was neceſſary to have recourſe to obſervation. They therefore contemplated Man, but contemplated him imperfectly. Many afterwards publiſhed their thoughts upon this ſubject; thoughts altogether frivolous and vain, and which might, for the moſt part, be reduced to ſome trivial maxims.

The ſcience of Man, hitherto treated in a vague and too general manner, was now reſolved into its conſtituent parts. Theſe were divided and ſtudied ſeparately. Anatomiſts examined the corporeal, and philoſophers, the ſpiritual part: Philoſophers diſtinguiſhed ſentiment from thought, made them two ſeparate ſciences, the knowledge of the mind or intellect, and the knowledge of the heart or affections, and divided the two provinces betwixt them. Metaphyſicians appropriated the former, and moral philoſophers the other.

Among thoſe who have beſt ſucceeded in theſe different branches, are Locke, Rochefoucault, and Winſlow.

Rochefoucault has examined the paſſions of the human heart, and has diſplayed their nature and principles indifferently well.

Locke has treated of the mental faculties, and has well inveſtigated them.

Winſlow has conſidered the phyſical part, and has handled it much better than the others have the ſpiritual.

Accordingly modern philoſophers have ſucceeded better than the ancient. But their obſervations being made by men whoſe talents and purſuits were different; by metaphyſicians who were not anatomiſts, and by anatomiſts who were not metaphyſicians; theſe were therefore unconnected, and the ſcience of Man conſiſted wholly in a number of ſcattered ideas. Accuſtomed to conſider the phenomena independent of their mutual connection, they, who applied themſelves to the ſtudy of this ſcience, perceived not the cauſes of the reciprocal influence of the ſoul on the body, and even the relations between theſe two ſubſtances, almoſt entirely eſcaped their obſervation.

Doubtleſs much had been already done; but the chief difficulty yet remained to be overcome. The faculties of the ſoul, and the mechaniſm of the body were known, but not the whole Man as compounded of both. No one had yet accounted for the ſingular relations between the two ſubſtances which compoſe his being; ſcarce any one had noticed their wonderful influence on each other.

Man therefore was conſidered as an enigma, as an impenetrable myſtery. Philophers, poets, orators, all expatiated on that contraſt of meanneſs and greatneſs; that medley of folly and wiſdom; thoſe ſudden changes; thoſe perpetual revolutions in the ſoul, which offer themſelves to every ones obſervation, inſtead of attempting to inveſtigate them and to diſcover their cauſes. But this work was not eaſy to be performed. To render theſe phenomena more marvellous, it was ſufficient to ſelect ſome contraſting and ſeemingly inconſiſtent ſituations. To elucidate them, it was neceſſary to ſtudy Man; to ſee him in every circumſtance; to obſerve carefully the reciprocal influence of the phyſical on the moral part, and to diſcover the reaſon of this influence.

This ſtudy ſeems to have been reſerved for phyſicians, whoſe profeſſion qualifies them for making ſuch obſervations; and who, being called to relieve the ſufferings of mankind, can contemplate the ſoul in all its various ſituations, and ſurprize it, if I may be allowed the expreſſion, in every degree of miſery or greatneſs. Accordingly phyſicians were the firſt who dared to enter upon this intricate ſcience. Philoſophers followed their example. Every one formed his obſervations ſeparately; but as they had not gained a ſufficient number of principles, and did not unite the diſcoveries of the anatomiſt with thoſe of the metaphyſicians, they made but few, and thoſe very trivial obſervations. The ſpirit of ſyſtem afterwards ſpread its dark veil over this dawn of knowledge, and the philoſophers of that age fell into the ſame errors with their predeceſſors. Before they had made a ſufficient number of proper obſervations, they attempted to account for thoſe phenomena which they obſerved, and by the little they knew, gueſſed the reſt; they built ſyſtems, and inſtead of deducing them from their obſervation, they wreſted their obſervations to quadrate with their ſyſtems. One endeavoured to explain every thing by phyſical, another by moral cauſes, and every one, for want of having comprehended the whole, and by being wholly confined within the narrow limits of his own knowledge, was conſtrained to treat this ſubject in a vague indeterminate manner, and to explain the phenomena by imaginary relations and by ridiculous hypotheſes: ſo that whilſt they believed themſelves ſure of having attained *Truth* in one inſtance, it eſcaped them in many others. Among theſe philoſophers, ſome deſirous to paſs for men of wit, ſacrificed truth to brilliancy of thought, and good ſenſe to elegancy of expreſſion. Thus, of their ſyſtems, ſome were abſurd, others imperfect, and all rather ſingular than juſt. But as my bare aſſerting theſe facts will not ſuffice, I proceed to offer the proofs of them.

Galen, and before him *Hippocrates*, obſerved ſome phenomena concerning the reciprocal influence of the body on the ſoul, but believed the ſoul to be material; whence their obſervations are but little worth.

Montagne in his Eſſays, *Robinſon*,* *Boerhave* and *Hoffman*†, have left a few obſervations

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* Thomas Robinſon. † Frederic Hoffman the younger.

ſervations on the reciprocal influence of the body and the ſoul; their views, however, were very confined, nor has any of them attempted to elucidate theſe phenomena.

Des Cartes was the firſt who undertook the taſk; but as his anatomical knowledge was very imperfect, and his metaphyſical notions erroneous, he fell greatly ſhort of his aim. He firſt confounded the impreſſions of external objects on the ſenſes with the ideas of the mind, and then made the different affections of the ſoul to conſiſt in modifications of the animal ſpirits; he aſſigned different parts of the head for the ſeat of the different mental faculties, and allotted to every idea a particular tube of the brain *. From the action of theſe ſpirits, differently modified, on the different organs, he accounted for every operation of the ſoul, viz. thought, judgment, good ſenſe, imagination, memory, and remembrance. Finally, from the different motions of theſe ſpirits, he deduced the order or the confuſion of our ideas. Thus ever hurried along by a warm imagination, inſtead of explaining the phenomena of nature, he has given only idle dreams, and contented himſelf with empty notions.

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* In his work intitled *L'homme*, Lib. 4.

To *Des Cartes* ſucceeded *La Metrie*, in a ſmall work *, the deſign of which is not eaſily diſcovered. Notwithſtanding his learning, and the aſſiſtance he might have received from his profeſſion, he appears to have obſerved nature not as a philoſopher, but as an illiterate man. Almoſt always led aſtray by appearances, he penetrated no farther than the ſurface in ſearch of truth; ſo that if we reduce his book, which has been ſo highly commended by atheiſts, to its juſt value, it will be found to be [illegible] collection of trivial obſervations, and of falſe metaphyſical reaſonings on the ſoul and its faculties; and, in a word, to be a ſyſtem wherein the author, without attempting to account for the reciprocal influence of the ſoul on the body, reduces every thing to the latter of theſe ſubſtances, and believes a thinking and free-being, ſuſceptible of virtue and remorſe, to be wholly material.

Secondat de Monteſquieu, a man in whoſe mind, delicacy, ſagacity and depth of thought were ſo happily blended, touched lightly upon this ſubject in his *Spirit of Laws.* Of all thoſe who have treated thereon, he was the firſt that deſpiſed the unintelligible Jargon of Pſycologiſts, and reduced the ſtudy of Man to that of nature. As he was a judicious obſerver, and an excellent judge, he has thrown ſome light upon the thick darkneſs in which theſe matters were involved, and could diſcern amidſt its obſcurity the path which would have conducted him to truth. In the ſlight ſketch he has left us, we diſcover the great philoſopher; and from the little we have, we can judge of the whole deſign, and regret that ſo great a genius, did not favour the world with a complete treatiſe on this ſubject, inſtead of the faint outlines he has left us.

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* Intitled *L'homme Phyſique.*

But among all the authors who have embarked in this attempt, *Helvetius* is perhaps the only one who undertook to handle this ſubject without any ſkill in anatomy, any proficiency in phyſic, or knowledge of the reciprocal influence of the ſoul on the body. Nay more, he has even written with a profeſſed deſign to demonſtrate the uſeleſſneſs of theſe helps, towards acquiring the knowledge of Man *. Being of an erroneous and ſuperficial underſtanding, he firſt builds a ſyſtem, by which he abſurdly attempts to reduce every phenomenon in Man to moral cauſes; and then confidently producing this as the only true and natural ſyſtem, he proceeds to glean from hiſtory ſome ſcattered paſſages and particular caſes to confirm his opinions, and tortures his mind to wreſt the phenomena to his purpoſe. Hence his work is only a ſeries of ſophiſms, elaborately adorned with a pompous diſplay of uſeleſs erudition.

Haller, a celebrated phyſiologiſt, has likewiſe treated this ſubject, but with no better ſucceſs than his predeceſſors. At his firſt outſet he wanders from nature, and afterwards makes vain and laborious efforts to arrive at truth. Having no clear knowledge of metaphyſics, he confounds the faculties of the mind with the properties of matter; after aſſigning the cerebrum as the ſeat of the ſoul, and as the ſole organ of its operations, he labours to deduce, from ſrom the different degrees of conſiſtence in this *viſcus,* and from the diverſity in the circulation of the blood in its fibres, the reaſon of the phenomena relative to the influence of the phyſical on the moral part in man. Hence we diſcover throughout his immenſe work no light whereby to demonſtrate the reaſon of theſe phenomena; and his ideas are a chaos as dark as the ſubject he undertook to clear up appears to have been to himſelf *.

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* This is more to be wondered at, as he makes ſenſibility and memory two phyſical faculties, which, according to him, are the only faculties of the ſoul. See ch. I. of Diſcourſe I.

Le Cat, the laſt of the moderns who engaged in this enterprize, ſeems to have exhauſted all his art on his ſubject. As he was a ſkilful anatomiſt, he poſſeſſed one part of the knowledge which muſt form the baſis of the edifice. And being an attentive obſerver, he cloſely applied himſelf to the ſtudy of nature, and probably would have penetrated far into its arcana, if, to his phyſical knowledge, he had joined the lights of ſound pſycology; if he had uſed more accuracy and attention in his obſervations; and had he not been ſo much poſſeſſed with the frenzy of ſyſtems. But as he wanted theſe aids, he failed in his deſign, and miſſed of that truth, which he believed he had attained to. It is true, we find in his works ſome good obſervations, and ſome ſcattered rays of light; there is even an appearance of ſomething like principles. But from his improper application of them; from his not being able to account for the phenomena which occurred to him, and were the conſequences naturally ariſing from them; and from his confuſed theory, we eaſily perceive, that the author was altogether unacquainted with nature, as well as with the extent, and conſequences of her laws: ſo that the knowledge of Man, which he pretends to teach, is ſo imperfect, ſo obſcure, ſo little developed, that truth itſelf appears hypothetic under his pen. Beſides, as his genius partook more of the elegance of a lover of poeſy and of polite literature, than of the manly force of a cloſe reaſoner, his particular aim was rather to give his ſubject an agreeable air, than that ſtrength and majeſty which form its proper character *; and he ſought more to

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* See the beginning of the 17th Book, in the fifth volume of his Phyſiology.

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* I make not this remark to blame erudition in philoſophical works; on the contrary, well employed, it is very ornamental: what I mean is, that erudition ought not to be the principal, the only merit.

to compoſe a work valuable for its erudition, than for its ſolidity and ſublimity. Hence his writings are embelliſhed with elegant anatomical deſcriptions *, and are filled with abundance of curious paſſages, in which their principal merit conſiſts. Theſe are the principal authors who have written on this ſubject; and who may juſtly be claſſed among the foremoſt in point of reputation.

There are others who have engaged in the ſame purſuit: but, except the ſmall number already mentioned, none are worthy of notice.

From the writers beſt upon this ſubject, we may ſelect ſome few obſervations that are juſt, and meet with ſome feeble light thrown at times over particular points; but the whole amounts only to ſome ſlight elucidation of a ſmall number of phenomena. Some of theſe philoſophers have diſcovered a few particular cauſes of the reciprocal influence of the ſoul on the body, but were all of them wholly ignorant of its great and leading principles; they have diſcovered ſome branches, but the ſource

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* See Treatiſe on the Senſations and Paſſions in General.

ſource was entirely unknown. Thus if all the juſt obſervations ſcattered throughout their writings were collected, they would only form a ſyſtem without a baſis, and without any connection of its component parts. Truth, concealed in their writings under a cloud of errors and abſurdities, appears with the air of mere opinion, whereas it might have had the force of demonſtration with every characteriſtic of abſolute certainty.

As all theſe different ſyſtems are ill combined, ill grounded, and do not carry conviction, philoſophers have not adopted them. On one hand, ſtruck with the contradictions which they perceived between nature and the principles laid down by authors; and on the other, aſtoniſhed at the variableneſs of the human mind, the cauſes of which were entirely unknown; diſcouraged by the ill ſucceſs of others, and moreover unable to diſtinguiſh truth from darkneſs, they have not attempted to elucidate the ſmalleſt phenomenon.

Thus for want of proper information, they were for confounding every thing, and treated every opinion indiſcriminately as ridiculous, every ſyſtem as abſurd, and even the deſign of ſearching into nature as preſumptuous. They proudly entrenched themſelves behind their own ignorance, ſaw prodigies in the moſt ſimple facts, and looked upon the knowledge of Man as an enigma, as an impenetrable myſtery, a labyrinth whence there was no iſſue *. Thus what they have written on the ſubject of Man, is no more than pompous inanity. With them, all is myſtery, all is inſcrutable; ever in an ectaſy, they ſhut their eyes againſt the truth, and contented themſelves with a ſtupid admiration.

So that at preſent, mankind may be ſaid to conſiſt of two ſorts of beings; the vain and preſumptuous, who are for aſſigning reaſons for every thing, even at the expence of good ſenſe and experience: and the timid and credulous who are in a perpetual ectaſy of wonder at all they behold. We may therefore conclude, that except a few ſcattered rays of light diffuſed over ſome particular phenomena, the ſcience of Man is hitherto entirely unknown.

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* For proofs of this, read the works of Hume, Voltaire, Bonnet, Racine, Paſcal, &c.

But when the greateſt geniuſes have been diffident of ſucceeding in handling this ſubject; when ſo many great men have failed, and others have not dared to engage, ſhall I hazard the undertaking, preſume to penetrate this palpable obſcurity and fathom this profound abyſs? What talents, what ſtudy, does ſuch a taſk require! What a fund of obſervation; what addreſs to reconcile ſo many ſeemingly inconſiſtent appearances, diſcover their connection, and amidſt ſuch a complication of facts, diſcern that light which explains thoſe principles which unveil and account for them! In a word, by the help of a glimmering taper, to diſcover ſuch a multiplicity of undiſcovered truths! How bold the enterprize, how difficult the execution!

Theſe reflections are diſcouraging I confeſs, and eſpecially when I conſider the mediocrity of my talents; however, they ſhall not make me renounce my reſolution. Neither the difficulty of the enterprize, nor the ill ſucceſs of thoſe who have preceeded me; nor the general prejudice, that it is impoſſible to ſucceed, ſhall prevent me from attemping it. Had men always yielded to deſpondency, truth would have ſtill remained buried in obſcurity, and the moſt important diſcoveries had been yet to make.

Whether I have ſucceeded, the impartial public will beſt determine. I plead no other merit than the intrinſic utility of the deſign: what that is, I now proceed to inform my readers.

Man is but little known, becauſe improperly ſtudied; the reaſon of which is, that no one, who has made the attempt, has followed nature. Inſtead of taking experience for their guide; inſtead of proceeding by juſt obſervations to lay down a general ſyſtem, of which every phenomenon was a neceſſary conſequence, philoſophers have acted directly the reverſe: they have invented ſyſtems, wreſted the phenomena to conform thereto, and forced nature to ſubmit to their opinions. I have endeavoured to avoid their error: as a ſimple obſerver, I eſtabliſh no ſyſtem till the neceſſity of facts obliges me thereto.

For Man to preſume, like the Creator,

to read what paſſes in the ſoul, is an abſurd vanity; accordingly every attempt of metaphyſicians with this view has proved unſucceſsful. As this principle acts internally, as it is imperceptible by the ſenſes, and cannot be ſeen but thro' the medium of the body, with which it is intimately united; by diſregarding the body, which is, as it were, a kind of cloathing to the ſoul, and a covering which muſt firſt be removed, we frequently attribute to the ſoul properties which belong to the body: thus ever judging from appearances, and never ſeeking to penetrate deeper, we fall ſhort of truth, and neglect the only mean which can conduct us thereto. We muſt therefore endeavour to penetrate to the ſoul through the integuments of the body, and obſerve the influence of the material ſubſtance upon the ſpiritual, to be able to diſtinguiſh the properties peculiar to it, from ſuch as are dependent on a foreign principle.

As the body is an extremely complicated machine, to form a ſound judgment of a ſingle ſpring, make a juſt eſtimate of the influence of one part upon another, and of every part upon the whole, diſcover the true relations between effects which appear remote, and connect particular phenomena with their general principles, we muſt firſt be acquainted with the ſtructure of the whole machine. The anatomiſt, therefore, muſt lay the foundation of the edifice; he alone can inveſtigate the ſecret ſprings which act upon the ſoul, affect it ſo ſtrongly, and of whoſe exiſtence the generality of mankind have no idea. I therefore begin by introducing my reader to the phyſical knowledge of the human body. I deſcribe Man as an hydraulic machine, and as a compound of veſſels and fluids; I then enter into a particular examination of theſe veſſels, of theſe fluids, and of the action of the organs. I afterwards conſider the body in its different mechanical relations, relatively to the nature of its functions; carefully avoiding a minute and diſguſting diſplay of anatomical erudition, that I may preſent to the reader eſſentials only, with ſome additional obſervations, equally ſolid and intereſting. The deſcription of the animal machine and the explanation of its mechaniſm every where ſucceed each other, and I demonſtrate in what manner this ſtudy conducts the intelligent obſerver to the ſolution of many curious problems.

As the anatomiſt muſt lay the platform of one part of this edifice, the metaphyſician muſt erect the other. From the examination of the ſtructure of the body, therefore, I proceed to enquire into the nature of the ſoul. Firſt, I conſider its different powers, and then trace its progreſs in the unfolding and exerciſe of them. I enter into none of thoſe ſubtil and ridiculous metaphyſical diſquiſitions, in which ſo many writers have waſted their time and labour; I offer none but ſolid obſervations, and ſuch as are ſuſceptible of an equal degree of evidence with the moſt unqueſtioned phyſical truths.

After we have conſidered the ſoul and the body independently of each other, we muſt conſider the two ſubſtances as united, and examine their relations, to be able to ſolve the wonderful phenomena ariſing from their reciprocal influence. I therefore conſider Man in this view: but as it has often happened, that authors have compoſed long and grave diſſertations on the cauſes of effects which never exiſted, I begin with eſtabliſhing facts. Beſides, as the great number of groundleſs opinions and erroneous ſyſtems have rendered truth itſelf ſuſpected, when not founded on clear and evident facts, I reaſon only from conſtant and repeated obſervations; from obſervations univerſally admitted and eaſily aſcertained, and ſuch as eſtabliſh my ſyſtem on the firmeſt foundation.

Nothing but a ſeries of accurate and uniform obſervations can give ſolidity to any ſyſtem. It is only by ſtudying nature, and by penetrating into its moſt ſecret receſſes, that we can attain to the diſcovery of its arcana. It is only by aids drawn from obſervation, that we can receive that light, which muſt direct us amidſt this darkneſs. It is not therefore by a vague and arbitrary hypotheſis, that we can hope to diſcover the ſecret cauſes of the influence of the ſoul on the body, and of the body on the ſoul. It is by an attentive examination of the phenomena; by comparing a great number of analogous caſes, and deducing from them ſome common property, which may be conſidered as their general cauſe and firſt principle. Thus, after collecting a ſufficient number of facts, I conſider them in all their different aſpects, account for every phenomenon from known phyſical laws, and by an attentive examination of them, attempt to draw ſufficient light to diſcover the principles of the reciprocal influence of theſe two diſtinct ſubſtances, and the natural explanation of their relations; that is, I endeavour to replace in the claſs of ſimple effects, thoſe phenomena, which have occaſioned ſuch wonder amongſt philoſophers.

But that my work may form a well connected whole, and that all its parts may ſerve to the elucidation of each other, it will be proper to place the reflexions of which it is compoſed in proper order.

I therefore firſt conſider Man in general and in the abſtract; then relatively to other animals; and afterwards to himſelf, following him gradually through every age, from the inſtant of his birth, to the final period of his exiſtence. I conſider him afterwards relatively to the difference of ſex, temperament and conſtitution; and laſtly, relatively to the ſoil, climate and condition. One word more and I have done.

As, from the nature of my ſubject, I muſt treat of many different matters, all of theſe could not poſſibly be comprehended in one continued treatiſe, or be preſented under one ſingle point of view, I muſt take leave to warn my readers, that they may expect to meet with many interruptions; the thread of the work will be broken off by the multiplicity of objects, and by the nature of the facts which may require to be ſpoken to. On the other hand, being under a neceſſity to keep the leading points ever in ſight, I muſt be attentive at the ſame time to every particular phenomenon as it occurs, ſo as not to let even the moſt minute eſcape me, ſince on theſe the connexion of the more important parts very often depends: the repetitions to be met with are to be accounted for from the ſame cauſes.

The plan of my work is too comprehenſive for me to preſume I have explained every relation. On the contrary, I am convinced that many things have eſcaped me: the ſubject is too copious, and gives riſe to ſuch an endleſs variety of ideas and reflexions, that it was frequently with difficulty I could keep ſight of the main ſcope of my deſign, ſo far from being able to exhauſt the ſubject. The great and moſt important queſtion is, whether I have well examined the things which belong to my ſubject amidſt ſo many perplexing ideas. The reader is the proper perſon to judge of that. I am ſenſible I may have been miſtaken in many reſpects; what Man, who conſiders as he ought the uncertainty of human knowledge, can be ſo vain, as to think himſelf ſecure from error?

If I have failed in my aim, I may be at leaſt permitted to indulge the hope, that my labour will not be entirely thrown away; that I have thrown ſome light on many phenomena, which before were involved in obſcurity; removed many difficulties; launched into an ocean entirely unknown; forewarned others of the rocks on which myſelf was wrecked, and opened a tract, by which others may hereafter proceed. If I have thus far ſucceeded, my part is performed, and (be it ſpoken without arrogance) I may ſay with Taſſo,

Faccia altrui la ſua parte.

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INTRO-

INTRODUCTION.

FROM the vaſt ſyſtem of beings, which nature offers to the conſideration of a philoſopher, let us ſelect Man, an animal, of which ſo much has been written and hitherto ſo little underſtood. What Subject can be more intereſting, or more worthy of our enquiries?

Let us ſurvey the whole ſcene of Man, obſerve what offers to the ſlighteſt obſervation, as well as that which is more intimately concealed. Let us follow the rapid movements and perpetual variations of the ſoul, point out the diverſity of minds and the lineaments which characterize them, diſplay the hidden principles of character, and the ſecret ſources of genius and of the paſſions. Let us remove the veil which conceals them from our ſight, and explain why one Man differs from another, and each Man ſo frequently from himſelf; let us enquire what Man is.

Man, conſidered as an individual, is not the object of the preſent enquiry; but Man in general, of all countries, of all climates,

mates, and of every age; an immenſe undertaking; a profound abyſs for the mind to attempt to fathom! Yet ſuch is the importance of the enquiry, that I ſhall not believe my labour wholly loſt, ſhould my ſucceſs hold any proportion to the dignity of my ſubject.

But from what data ſhall we reaſon upon Man? How diſcover the affinity between the ſubſtances which form his being, and the cauſes of their wonderful influence on each other, without being firſt acquainted with the ſubſtances themſelves? And how are we to gain this acquaintance, but by conſidering their effects? Let us then examine theſe effects; endeavour to analyſe Man, and reſolve him into his original elements of body and ſpirit; conſider their properties and functions, and view the order obſervable in the mechaniſm of the one, and in the exerciſe of the faculties of the other.

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BOOK I.

OF THE

HUMAN BODY.

MAN, in common with all animals, is compoſed of two diſtinct parts, ſoul and body *; the body being the firſt of theſe which preſents itſelf in Man, and the only one whereof our ſenſes give us any diſtinct idea, ſhall be the firſt object of conſideration.

But firſt let me contract ſo extenſive a ſubject, and endeavour to reduce it within its proper limits.

I ſhall not conſider in this work, thoſe properties of the body which it poſſeſſes in common with matter in general, ſuch as extenſion, ſolidity, gravity; nor, in ſhort, any thing which does not belong to it as an organized machine.

Neither is it neceſſary for me to undertake the anatomical deſcription of the parts

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* I ſhall not ſtay here to prove ſo eſtabliſhed a truth; ſhould any of my readers entertain the leaſt doubt, he may diſpenſe with reading my work: it is not for ſuch I write.

which compoſe this machine. To give an exact deſcription of them, is a taſk I ſhall leave to anatomiſts.

The deſign I here propoſe to myſelf, is to conſider the mechaniſm of the human body in ſome general points of view, and chiefly with reſpect to comparative anatomy; I confine myſelf to ſuch deſcriptions only of this machine, as are neceſſary to give a proper knowledge of its functions, and to enable me to convey my ideas with order and preciſion.

The material part of Man forms an admirable machine on hydraulic principles; we diſcover therein innumerable channels with fluids of various kinds, and particularly one principal fluid which gives motion to the whole. I ſhall omit the prolix obſervations of anatomiſts, and the calculations of *Verdriers* of the prodigious number of our veſſels: I ſhall only obſerve, that both the eye and the microſcope convince us, that the human body is entirely compoſed of veſſels, of liquors contained in thoſe veſſels, and of membranes to which they adhere.

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Both veſſels and membranes are termed *ſolids*; all the other parts are claſſed among the *fluids*.

Of the SOLIDS.

The ſolid parts of the human body are all compoſed of an homogeneous ſubſtance, of a gelatinous juice, or rather of the ſolid parts of this juice, more or leſs ſeparated from the fluid, and intimately combined one with another.

In analyſing the organic parts of the animal machine, the deepeſt reſearches have ſucceeded no farther than the diſcovery of a ſimple fibre; and of this we judge more from the imagination than from the ſight.

From the moſt attentive examination of the carnous ſubſtance of the body, the moſt ſimple fibres which the microſcope can diſcover appear hollow, and the climentary parts of theſe fibres, we may eaſily perceive, are compoſed of other ſmall fibres which have no cavity, much reſembling a filament of ſilk, which is compoſed of many ſmaller filaments; and this fibre without a cavity is what we call *a ſimple fibre*, ſee fig. 1, and muſt be conſi-

dered

dered as the organized principle of all the ſolids, ſince it is the fartheſt boundary to which our reſearches can poſſibly attain.

From this idea of the conſtruction of fibres, it will be no difficult taſk to diſcover their properties; they will be lax and flexible, if too much moiſtened with lymph, or if their elementary capillaments are not cloſely enough united; on the contrary, they will be ſtiff and rigid if the lymph be too ſparingly ſupplied, and if their conſtituent parts are too firmly combined. The ſolid parts of the animal machine differ one from another by their texture, according as it is more or leſs compact; upon this difference depends that of their *primitive elaſticity*.

Simple fibres united in a parallel direction, and faſhioned into a cylinder, form a ſmall tube, which we term *an organic fibre*, or *fibrilla*. See fig. II.

Many organic fibres united compoſe a *muſcular fibre*, ſee fig. III, and of theſe organic and muſcular fibres are formed membranes, veſſels, the carnous ſubſtance of the body, the bones, muſcles, and the whole texture of the ſolids.

Of

Of the Fluids.

The liquors of the human body have, in common with all other fluids, fluidity, and a peculiar compoſition.

Theſe liquors are not all of the ſame kind; they differ in colour, ſmell, taſte and conſiſtence: examined chymically, they vary likewiſe; they are indeed all compoſed of an aqueous principle, which ſerves as a vehicle to the globules contained therein, the baſis of which is earth impregnated with ſulphurous, ſaline, and ſpirituous particles: but theſe are more or leſs ſubtile in ſome, more or leſs groſs in others, and in all differently combined.

Of the fluids of the animal machine, ſome are formed, in the animal itſelf, of the juices which are extracted from the aliments, either cruſhed or diſſolved, as the chile, the blood, the bile, &c. the others come already formed from without, as the ætherial fluid, the air, &c.

SECTION I.

Of the Body, conſidered as the general Organ of SENSE *and* MOTION.

ALthough the body is composed of ſo many different machines, and although each of theſe machines has its particular functions, yet theſe different functions are performed upon theſe two principles only, viz. *Senſe* and *Motion*.

The motion of the heart and veſſels, is the cauſe of the circulation of our fluids; the motion of the jaws divides the aliments; the irritation of the ſalival and ſtomachic glands, occaſioned by the attrition and ſtimulus of the aliments preſſing them to diſcharge their liquors, when ſet in motion by the internal heat, performs digeſtion. By motion external objects act on the body, and by the ſenſes we receive their impreſſions: finally, by motion and ſenſe, we perform both thoſe actions which are voluntary, and thoſe which appear to be mechanical. Examine the functions of our organs, all the phenomena of the animal œconomy, and you will not find one which has not for its cauſe either the one or the other of theſe principles, or the two principles united.

If we enquire into the origin of this principle in a living animal, we ſhall obſerve, that of all the parts of the body, the nerves only, and the nervous productions, are the ſeat and organs of motion, as may be proved by a great number of experiments.

Extenal objects act on our bodies; we feel this impreſſion in that part on which they act, and the ſoul is conſcious of this impreſſion.

We can extend and move our limbs at pleaſure; if I would extend my arm, in an inſtant my arm is extended; here the ſoul commands and the body obeys.

If you fix a tight ligature on a nerve at its inſertion into a muſcle or on any part higher, immediately the muſcle loſes its motion. If you force the point of a lancet into this muſcle, which will be now paralytic, it immediately contracts, but the ſoul is not conſcious of this impreſſion; when the nerve is divided, you will obſerve the ſame effect.

Puncture the heart of a living animal, and you will find the heart to contract;

ſeparate this heart from the body, again puncture it, and you will find it again to contract; however frequently you may repeat this experiment, the ſame phenomenon will enſue: proceed further; divide the heart into many pieces, puncture every one apart, and in each the ſame effect will be ſeen. Take any animal you pleaſe, the ſame effects will always follow the ſame experiments.

If you cut the body of a viper into many pieces, you will perceive every part to be contorted and moving like ſo many diſtinct animals; whilſt the head will be reverted, and will attack its hinder parts with its teeth.

During a battle, limbs ſeparated from the body are frequently perceived palpitating on the ground.

Thus the principle, which cauſes the conſtruction of the heart and the motion of the limbs, ſubſiſts for a while after they are ſeparated from the body.

From theſe experiments, frequently repeated and conſtantly attended with the ſame event, it follows,

Firſt, that the ſoul is not the immediate mover of the body.

Secondly, that the ſoul does not feel in every part, nor is it diffuſed through the whole body.

Thirdly, that ſenſation is performed by the nervous fibres upon which objects act.

Fourthly, that ſenſations are communicated to the ſoul by the nerves. The body is therefore ſenſible of itſelf independently of the ſoul, ſince irritability is a property of nervous fibres: in this caſe, the reality confirms the appearance.

But object not, as ſome philoſophers have done, that the ſoul is often confounded with the body, from whence it happens, that the ſoul imputes its peculiar ſenſations to the body, and believes that it is the body, when it is the ſoul only which feels; thus the ſoul imagines that the ear hears, the eye ſees, and the finger ſuffers the pain of a puncture, which is felt only by itſelf. Neither ſay with a celebrated modern phyſiologiſt *. "That "an immaterial ſubſtance occupies no "ſpace, that it cannot be ſaid the ſoul "can be in two or more places at one and "the ſame time, although by its influence

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* Le Cat, in his Treatiſe on Muſcular Motion, page 306, Berlin 1765.

"it act in ſeveral places at the ſame inſtant; that it acts there by its influence only, but not phyſically like a material ſubſtance, ſince the ſoul is not material; that if the action and influence of the ſoul, exerciſed in ſeveral parts at one time, prove its diviſibility; it will not be at all neceſſary, in order to eſtabliſh that opinion, to cut an animal into many parts; that if you puncture at the ſame time the hands, the feet and the face of a living perſon, eve- one of theſe organs will contract to avoid the pain; that the heart, ſeparated from the body of an animal, and the divided parts of an eel, are not more diſtant one from another, than the parts juſt mentioned are naturally diſtant in Man." What can theſe ſpecious arguments avail againſt direct facts?

"The ſoul is not material, neither does it occupy any place in the ſame manner with a material ſubſtance." Be it ſo; but does it follow from thence, that it has no determinate ſeat, whence it extends its influence? Fix a tight ligature on a nerve at its inſertion into a muſcle, does it not render that muſcle paralytic, and cut off all communication of the ſoul with that organ? Does it not entirely deſtroy their connection? And is not whatever is acting in that part, as perfectly unknown to the ſoul, as if the part were itſelf removed to the greateſt diſtance? If then the ſoul perceives not what is acting in any organ after the ligature is fixed on its nerve, is it to be ſuppoſed, it can perceive what is acting in the ſame organ after amputation.

Why then does the muſcle contract itſelf upon any painful impreſſion, after the ligature is made? It is becauſe the ſubſtance of the nerves is really itſelf ſenſible. And beſides is it not evident, that if the body be inſenſible, the ſoul muſt always command the body to receive the impreſſions of objects? And that without this command, objects would not produce any ſenſation in the ſoul, as the eye perceives not diſtant objects without the aſſiſtance of the teleſcope? If the nerves had no ſenſe, how could they communicate to the ſoul any ſenſation which they themſelves had not received? How could they affect it, ſo frequently as they do, in oppoſition to itſelf?

With regard to the motion and contraction of the organs, I well perceive that the ſoul, though ſimple in its ſubſtance, can at one and the ſame time influence many organs in the animal machine; but it cannot perform this without the aſſiſtance of the nerves, and that only, as I ſhall prove hereafter, when the ſubſtance of the nerves is ſound, without compreſſion, and without a ſolution of continuity, and when the fluid with which they are filled has free communication with its ſource. Can it do ſo when a nerve has been divided, and the influx of the fluid interrupted? Or in the limbs, which have been ſeparated from the body, though yet palpitating with life, can the connexion ſtill ſubſiſt? Is not every member when diſunited an entire independent body? It is therefore idle to pretend to compare the conformity of the diſtance betwixt the divided parts of an eel, with that of the diſtinct parts of an human body, as equally influenced by the ſoul. Beſides, how can we preſume to aſſert, that the ſoul acts in each of theſe mutilated parts, without affirming at the ſame time that the ſoul may be divided?

Shall we ſay that every part ſo divided has a ſoul? This would be giving many ſouls to one animal; or if you would rather ſuppoſe that the body has no ſenſibility, it can then have but one ſoul, which was divided at the time when the limbs were ſeparated from the body: what abſurdities is this ſyſtem compoſed of! Let it not be objected, that the ſenſitive plant contracts itſelf on being touched in the ſame manner with the nerves; neither aſk if ſenſibility be a property of matter; of what uſe would the ſenſe of feeling be to a being which has none of the other ſenſes? I would anſwer, That is entirely unknown to me; but what can you infer from thence? That there is ſomething ſuperfluous in the works of the Creator? Are you acquainted with all the laws of nature, thus daringly to determine on its works? Neverthelcſs when I have yielded you this, what concluſion can you draw from this, againſt the ſenſibility of the nerves?

There are caſes where contraction is not the effect of ſenſibility, but of ſome mechanical cauſe, ſuch as the contraction of a ſtring of catgut, parchment, or green wood, expoſed to the heat; the elaſtic ſtuid, fluid, which is contained within their ſubſtance, being diſengaged by the action of the fire, eſcapes, and in eſcaping, agitates the body in which it was contained. The caſe may be the ſame, where the contraction following a puncture, is the conſequence of laws purely phyſical, and not the effect of ſenſibility. It may likewiſe be the caſe of the ſenſitive plant, but this is a problem no one is able to reſolve. The queſtion, which regards this plant, will remain for ever undecided: as the plant is not animated, ſenſation may be ſo produced, as to preclude all means of diſcovery.

In animal bodies, the contraction which immediately follows any painful impreſſion, is certainly the effect of ſenſibility, as is proved by the identity of the phenomena in the amputated parts of the body, and in the body before amputation.

Hence the denying ſenſibility to the body *, and giving it entirely to the ſoul, is to oppoſe evidence itſelf.

Of

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* But are our nerves endued with ſenſibility, as being compoſed of ſenſible parts, which parts are formed of very minute ſenſible particles? Or is not ſenſibility a quality which reſults from their particular arrangement?

Of the Seat of the Soul.

The ſeat of the ſoul naturally preſents itſelf here for our determination.

The reader, aſtoniſhed that the ſoul feels not in every part of the body, will doubtleſs enquire where the ſeat of the ſoul is. This queſtion muſt be anſwered by facts.

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ment? Who is aſſured of this? Yet, to judge by our imperfect conception of the grounds of things, we would be apt to believe, that the elements of the body are not endued with ſenſibility; they are perfectly ſolid, and conſequently incapable of any diſarrangement of parts, without which external objects cannot make any impreſſion on the ſenſes. Beſides, all bodies are compoſed of ſimilar elements, and of principles which are common to all, only differently arranged; the principles of which nerves are formed, are ſimilar to thoſe of which leaves, flowers, fruits, and plants are compoſed; hence ſenſibility probably belongs to matter, as a property dependent on its organization. Moreover, ſenſibility extends itſelf to every part of the body, in the ſame manner as life, and animates theſe parts no longer than while the fluid of the nerves remains, (ſee the experiments hereafter mentioned) and while the combinations of the organs continue unchanged. But who can admit theſe reaſons as demonſtrative? Who has ſo little obſerved nature, as to undertake to explain the whole by the ſmall number of its known laws, and to think there is nought but uniformity in the univerſe.

We know that the membranes which ſupply a coat to the ſpinal marrow, are a continuation of the meninges, and that they give riſe to all the nerves of the lower parts. In all animals, a tranſverſe ſection of the *medulla ſpinalis*, is immediately followed by a paralytic affection of all the parts ſituated below that ſection; after which, the ſoul receives not any ſenſation from theſe parts.

Luxations, whereby the ſpinal marrow is compreſſed, are attended with the ſame effects.

If you divide the membranous productions of the brain, or that part whence they ſend off a coat to the *medulla oblongata*, or even fix a tight ligature thereon, the whole body of the animal is inſtantly without motion, and the ſoul is deprived of ſenſation, the head only giving ſome faint ſigns of life. This is evident in the *Tetanos*, a diſeaſe ſomewhat uncommon, produced by a violent contraction of this part. In the palſy, a diſorder ſo frequent and ſo dreadful, life is gradually extinguiſhed, the limbs ſucceſſively loſe their motion, the extremities become inſenſible, death ſteals on the trunk, marking his courſe on every part he paſſes over until ſcarce any ſigns of life are perceived, and theſe in the head only.

If theſe obſervations do not preciſely mark out the ſeat of the ſoul, they ſhow at leaſt that we are to look for it no where but in the head. To theſe proofs let us add our own feelings; every one who thinks intenſely, perceives a kind of tenſion within his head, and that his ideas are formed within that organ.

Anatomiſts agree, that we muſt look for the ſeat of the ſoul in the head; but they are not unanimous what place it occupies in that part of the body. Some place it in the *pineal gland*, others in the *corpus calloſum*, others again in the *cerebrum*; ſome in the *cerebellum*, and ſome in the *meninges*. But of theſe different opinions, the laſt only is well founded; for, if we trace the nerves to their entrance into the membranes of the brain, we ſhall find they confound themſelves with the *meninges*, and form one ſimple uniform ſubſtance with them. Hence if the nerves only are ſenſible, and if the ſenſations are not continued to the ſoul but by theſe organs, we plainly perceive, that the meninges muſt be eſteemed the ſeat of the ſoul. For as theſe membranes and their productions are the general organs of ſenſation, and as the ſoul is at the concourſe of all the ſenſations of the body, its ſeat muſt be in that part where this concourſe appears, viz. at the centre of all the organs of ſenſation; theſe membranes are this centre. Experience likewiſe daily confirms it; the ſlighteſt inflammation of the meninges occaſions a delirium, and a temporary inſanity. The irritation of the nerves, by the fumes of wine from drinking to exceſs, or by the fumes of tobacco, is followed by the irritation of the meninges and loſs of reaſon; this never happens to any other part of the head.

The ſubſtance of the cerebrum and cerebellum, may be taken from a living animal, without the ſoul's being inſtantly affected; and though the wounds of the centre of the brain, of the pineal gland, and of the corpus calloſum, ſometimes injure the functions of the ſoul, it is not becauſe the ſeat of the mind is in either of theſe parts; but becauſe theſe parts ſecrete a fluid which is neceſſary to its operations, and by reaſon of the irritation which wounds in theſe parts communicate to the meninges.

In theſe membranes eternal wiſdom has placed the ſoul, and united it to our organs by imperceptible bands; here it has fixed the ſeat of thought, of memory, and of the will.

More accurate obſervations may hereafter fix preciſely the ſeat of the ſoul in theſe parts, and determine that *ſenſorium commune*, which has occaſioned ſo much diſſenſion among philoſophers, and of which they have hitherto formed ideas ſo erroneous and abſurd.

Of the Structure of the NERVES.

We know the nerves to be a continuation of thoſe membranes, which ſupply a coat to the ſpinal marrow; the fluid which is contained in their trunk will then circulate through their ramifications.

Examine in a living animal the thickeſt part of a nerve after its diametrical ſection, or where there is a ſolution of continuity by an ulcer, and you will find a whitiſh liquor to ooſe from it, of the colour and conſiſtence of the white of an egg *, Here the exiſtence of that very fluid, which was eſtabliſhed by the neceſſity of facts, is proved by ocular demonſtration. Hence the nerves appear to be real tubes, although their internal ſubſtance ſeem entirely compact, ſo that, though aſſiſted by the beſt glaſſes, we cannot perceive the leaſt cavity.

We muſt therefore diſtinguiſh in the nerves two things, which are common to all other veſſels in the animal machine, viz. the ſubſtance of the nerve itſelf, and the fluid which circulates within it.

The ſubſtance only is ſenſible; the medulla of the brain has been proved to be void of ſenſibility, even in the cerebrum itſelf. The Memoirs of the Academy of Surgery at Paris contain many obſervations on foreign bodies, ſuch as muſket balls, pieces of iron, heads of arrows, points

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* Some accidental cauſes may prevent the efflux of this liquor immediately after the diviſion of a nerve in a living animal, ſuch as that contraction of the fibres, which ever accompanies any painful ſenſation: but it is only in living animals that we can diſcern this efflux; in a dead animal this fluid is coagulated and fixed in the rigid veſſels, as is its blood in the veins.

points of ſwords, ſplinters of the cranium, contained for many years in the ſubſtance of the brain, ſome of which had never been diſcharged; and this without occaſioning the leaſt injury to the perſons in whoſe brains they were found. But there are proofs yet more convincing. Open the brain of a living animal, juſt at the ſection of the meninges, the animal will ſuffer extreme agony, and vent the moſt doleful cries; keep the lips of the wound open, and when its cries remit, thruſt the point of any inſtrument a good way into the ſubſtance of the brain, the animal will ſtill be ſilent and not give the leaſt ſign of any painful ſenſation.

The medulla of the brain is then inſenſible; ſo is the nervous fluid. The experiments of *Mariotte* prove, that the light, which directly acts on that fluid at the extremity of the optic nerve, makes no impreſſion thereon; and that, to communicate its impreſſion to that fluid, is required the mediation of a ſolid membrane. The experiments of *Mery* prove the ſame with reſpect to the retina, which is an expanſion of the medulla of the optic nerve.

Therefore the ſolid part only of the nerve is ſenſible; but in what manner do the nerves communicate their ſenſations to the ſoul? Is it by the ſubſtance of the nerves, or by the fluid which circulates within them? An anſwer to this queſtion is likewiſe to be deduced from facts.

We have ſeen in the foregoing experiments, that after a ligature is fixed on a nerve, the ſoul is not conſcious of any impreſſion of objects on the muſcle, into which this nerve is inſerted; the ligature then has cut off its communication with the ſoul. That interception is not occaſioned by the ſimple ligature, but by interrupting the action of its fluid: otherwiſe the impreſſion, which an object has made on one part of a nerve, would be continued by its ſubſtance, as the motion which is communicated to one end of a cord, which is ſtrained and tied in many parts, will extend, notwithſtanding the tying, to the other extremity; the ligature not having occaſioned a ſolution of continuity. I could likewiſe, if neceſſary, oppoſe to thoſe writers who attribute this communication to the ſubſtance of the nerve, and who pretend, that the ſenſations are communicated to the ſoul by the tremor of the nervous fibres, by an uninterrupted continuity of a vibrating nerve, that the nerves are ſometimes relaxed; that they make many circumvolutions in their various branches, that their principles are to their productions, or their trunks to their branches *, as one to many thouſands; in fine, that moſt of the nerves terminate in ganglions, and that the greater part take their riſe from them, and not immediately from the covering of the brain. Thus the impreſſions of objects, communicated to the nerves, cannot be propagated by their ſubſtance: for how can the nerves, which never reach the brain, carry the impreſſion of objects to the *ſenſorium commune*? The ſenſations muſt therefore be produced by the coats of the nerves, and be communicated to the ſoul by the nervous fluid.

But how can an inſenſible ſubſtance communicate a ſenſation, of which it is not at all ſuſceptible in itſelf. This queſtion I confeſs myſelf unable to anſwer, neither is it related to my preſent ſubject.

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* From a ganglion, which takes its riſe from a ſingle nerve, frequently ſpring about an hundred other nerves nearly of the ſame magnitude, and from this hundred near a thouſand more.

We have ſeen that the tying a nerve, ſomewhat above its inſertion into a muſcle, is followed by a paralytic affection of that muſcle; but if you preſs that nerve with your fingers, gradually moving them from the ligature towards its inſertion, you will immediately perceive the muſcle to contract and recover its motion. This can only be occaſioned by the fluid contained in the nerve, and determined towards the muſcle by this compreſſion: hence it appears, that the motions of the muſcles depends on their being connected with the brain by the nerves.

From what has been ſaid it is concluſive, that the ſenſations are communicated to the ſoul by the nervous fluid. Hence this fluid acts immediately on the ſoul. And ſince the nervous fluid is the immediate principle of motion to the body, the ſoul acts directly on this fluid in all voluntary motions.

Thus it is by the nervous fluid, that theſe two different ſubſtances communicate with each other.

Of the Union of the SOUL *and* BODY.

But after what manner can a material ſubſtance act on an immaterial? The judicious reader certainly expects not that I ſhould aſſign a reaſon for a connexion impoſſible to explain: we are entirely ignorant of the eſſence of things; their relations are all we are permitted to know; this knowledge is the only object I have propoſed to myſelf in this Treatiſe.

Here metaphyſicians may exclaim. Is the ſoul then material, that matter can act upon it? Let us allow theſe men ſo arrogant, and yet ſo ignorant as to refuſe their aſſent to every thing which they cannot comprehend, to ſhut their eyes againſt every thing above their capacity. More humble and more wiſe, let us acknowledge our own weakneſs, though ſtill open to conviction and to truth, when accompanied with demonſtrative evidence: even although it may ſeem incomprehenſible, inſtead of endeavouring to overthrow the admirable laws of nature, with a view to bring down its arcana to a level with our narrow conceptions.

Farther Obſervations on the Origin and Structure of the NERVES.

The only part of the nerves which has ſolidity, is the coat they receive from the membranes of the brain: hence it appears, that thoſe membranes of the brain compoſe the ſubſtance of the nerves: this is evident from the moſt accurate diſſections.

Although all nerves take their origin from the meninges, like the reſt of our ſolids, yet they take it not always immediately therefrom; for the origin of the nerves in the brain is extremely ſmall, and on the contrary, their diviſions are extremely large and numerous: beſides, the nerves of the ſpine go not to the brain; and it has been proved, that a great number of nerves are originated from ganglions, and that the greater part of them terminate there likewiſe Nor have all our nerves the ſame origin in the head; ſome are generated from the medullary ſubſtance of the * brain; others from the *medulla oblongata*;

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* The ſix firſt pairs.

longata *; and others again from the ſpinal † marrow.

In regard of their ſtructure, ſince theſe organs are compoſed of veſſels, or rather of *faſciculi* of ſmall fibres, every one of which is formed of many ſmall tubes united under one common covering; this ſtructure muſt follow the ordinary laws of that of the other veſſels; that is, the ſubſtance of every ſmall tube is compoſed of many other ſmaller tubes, which are formed of elementary fibres, or fibres without a cavity.

In what manner the Soul acts on the Fluid of the Nerves, and the Fluid of the Nerves on the Soul.

And here let us recal a very important obſervation.

We have ſeen that the fixing a tight ligature on a nerve, ſomewhat above its inſertion into a muſcle, renders that muſcle paralytic: we have ſeen likewiſe, that if the nerve be preſſed with the fingers, gradually moving them from the ligature to its inſertion, the muſcle immediately contracts and recovers its motion.

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[*] The ſeventh, eighth, and ninth pairs.

[†] The three firſt pairs called cervicales.

This obſervation determines the manner of the ſoul's action on the fluid of the nerves: and hence its appears, that its action on this fluid is an impulſive motion towards the organ it wills to contract. The impoſſibility of repelling the fluid, with which the nerve is replete, towards the ligature *, without repelling at the ſame time a part towards the muſcle, deprives us of the means of proving this by the oppoſite experiment. But an obſervation eaſy to be made, and which is nearly equivalent to this experiment, is, that the quantity of the fluid which, in this latter inſtance, is determined towards the muſcle, is leſs than in the former; the contraction muſt therefore be weaker, as experience fully confirms. *Le Cat*, who had not made this obſervation, was aſtoniſhed on compreſſing the nerve, gradually moving the preſſure from the muſcle to the ligature, to find the muſcle contract. Deceived thereby, he ſtrenuouſly aſſerted, that it was not by the influx of the nervous fluid into the muſcle, that that organ recovered its motion, and gave the experiment to ſupport his aſſertion. But the ſame thing happened in this experiment, as in many others, viz. appearances concealed truth from the eyes of the undiſcerning ſpectator.

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* That is, towards the part between the fingers and the muſcle.

With regard to the manner in which the ſenſations are continued to the ſoul, it is evident to me, that this muſt be occaſioned by the reflux of that fluid to the *ſenſorium commune*. But this is impoſſible, ſays the phyſiologiſt *, juſt cited: " For the " ſpirits are impelled inceſſantly to every " part by the motion of the meninges, as " the arterial blood is impelled by the " heart towards the ſame membranes. " How can it be imagined, that a ſtraw, " which tickles the ſole of the foot, can " repel the nervous fluid to the brain, " ſince there is no impreſſion ſufficient to " repel the leaſt drop of blood from the " feet to the heart? If this reflux were " the cauſe of theſe ſenſations, the placing the palm of the hand upon any " part of the body, would excite a much " greater reflux, and conſequently a much " ſtronger ſenſation, than would be felt

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* Treatiſe of the Senſations and the Paſſions, vol. 1. page 186. Paris 1767.

" from forcing a pointed inſtrument into " the part, which nevertheleſs produces " a much more pungent ſenſation."

We ſhall perceive how weak this objection is, if we conſider but for a moment, how exceedingly gentle the motion of the meninges is, which determines the nervous fluid into the nerves, when compared with the motion of the heart, which impels the blood into the arteries, particularly if we only obſerve, that the nerves have no valves like the blood veſſels, to prevent the reflux of their fluid; above all if we obſerve, that our author is unacquainted with the cauſe of the reflux of this fluid, and that he confounds the force of this reflux with the quantity of the fluid in motion. For it is not the action of an external object, as a compreſſing cauſe, but as an irritating one, which occaſions the nervous fluid to flow back. By irritating the nervous fibres, it obliges them to contract and to impel the fluid, which is now compreſſed in their contracted channels, with ſo much the more force as the irritation is greater. Now as that contraction begins always in the part affected, ſo the nervous fluid is always neceſſarily determined towards the origin of the nerves. How ſimple this mechaniſm! How perfectly concordant with its phenomena! And how completely it removes ſuch objections!

Although the ſenſations be communicated to the ſoul by the reflux of the nervous fluid, it does not follow from thence, that the portion of this fluid, which is contained in the organ immediately affected, continues its reflux quite to the ſoul. This communication is effected by the continuity of the column of the nervous fluid: that part therefore of this column, which is ſurrounded by nervous fibres, which are immediately affected, is the medium of communication with the other parts, and ſo on towards the brain, by their reciprocal and inſtantaneous preſſure.

Of the NERVOUS FLUID.

I have proved, that the nervous fluid is the band which unites the ſoul and the body: the exiſtence of this fluid is evident: but what is its nature? To diſcover this, let us conſider its effects; beginning with a ſhort examination of the organs by which it is prepared.

The *cerebrum* is the filtre of this fluid, and the *cerebellum* its reſervoir. The cerebrum has all the characters of an organ of ſecretion; its cortical ſubſtance is formed of an infinite number of very minute glands, which are found in all organs of that kind; its medullary part is compoſed of ſmall fibres, whoſe direction may be eaſily perceived, although their cavity be undiſcoverable by the beſt glaſſes: the particles which form that fluid are carried into the filtre by the carotid and vertebral arteries. Thus the nervous liquor is ſecreted from our other fluids: but what do our fluids ſupply to the brain for the production of this ſubtil liquor? Or rather, what is this liquor itſelf? It is only by conſidering its effects, as I have already ſaid, that we can diſcover its nature; let us therefore examine its properties.

The nervous fluid ſerves both to the motion of our organs, and to the nouriſhment of the nerves: I ſhall examine it in theſe two points of view.

The nerves receive an increaſe proportioned to that of the other parts of the body; and, their ſubſtance not being penetrated by any foreign organ, they take their increaſe from the fluid which circulates within them: this fluid muſt therefore be analogous to the ſubſtance of the nerve, and is, in fact, a nervous jelly, ſince all the nervous productions are reſolvable into a liquor of this kind.

This gelatinous liquor is very obſervable in the internal part of the brain and its ventricles; it may be ſeen oozing from ulcerated nerves; it may alſo be diſtinguiſhed in that tumor, which is formed by the nervous fluid extravaſated from its natural veſſels, known by the name of the *hernia ſpinalis*: it is particularly obſervable in the ſemen; in a word, all our fluids are viſibly ſupplied with this gelatinous lymyh.

But the nervous fluid is not ſimply the principle of nouriſhment to the nerves, it is likewiſe the ſource of ſtrength to the whole body: the animal, in which this fluid abounds, is diſtinguiſhed for its uncommon ſtrength; its loſs occaſions langour and dejection. Can this quality then be the cauſe of both theſe effects? To determine the queſtion, I ſhall endeavour to reaſon from facts.

A conſiderable loſs of this fluid, affects us with langour and dejection; it is ſcarce extravaſated from its veſſels, when the body no longer retains its vigor, the limbs are without ſtrength, and the organs in a general ſtupor. By ſuppoſing this fluid to be no other than the nervous lymph, we might eaſily conceive how any conſiderable loſs of it would, in length of time, render the motions languid; but why is it followed by inſtant depreſſion, and by ſo aſtoniſhing a languor, ſince the nerves are not without nouriſhment? For the nervous fluid loſt, was certainly intended to nouriſh the nerves for ſome ſpace of time. It is therefore manifeſt, that if the weakneſs, which enſued on the loſs of that fluid, was produced by a diminution of nutrition, by an atrophy of the nervous parts, it would have come on by degrees, and not inſtantaneouſly.

But let us penetrate yet farther, and endeavour to diſcover the nature of this fluid, from the manner of its preparation.

The nervous fluid is inceſſantly diſſipating, it is exhauſted by action and likewiſe by reſt: for we perceive our ſtrength to fail after faſting, though in a ſtate of perfect inaction, in the ſame manner as after violent exerciſe.

When a perſon is under this languid depreſſed ſtate, if you give him ſomewhat moderately ſpirituous to drink, he finds his ſtrength immediately recruited and his vigour renewed: the draught therefore has reſtored to the nerves the principle they had loſt. How ſhould this be poſſible, if the nervous fluid be only a purely gelatinous juice; ſeeing we cannot extract one gelatinous particle from any ſpirituous liquor? Hence, beſides this gelatinous juice, the fluid of the nerves is compoſed of a ſpirituous lymph: I ſay ſpirituous, becauſe thoſe aliments which abound with ſpirits, ſupply the body with this principle of life, and becauſe a very ſmall quantity of ſuch aliments ſupplies more of it, than a very great quantity of food which is only ſlightly impregnated therewith *.

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* A glaſs of any cordial wine gives more ſtrength than ten times the ſame quantity of a decoction of oats or barley; it is however certain, that art cannot extract any gelatinous particles from this wine, nor is it certain that it contains any. On the other hand, it is evident, that a decoction of barley is ſtrongly impregnated therewith, and that ten parts of this decoction produces two parts or more of purely gelatinous juice.

Should any one object, that theſe ſpirits will injure the nerves by acting on their internal ſubſtance, ſeeing they have that effect when applied outwardly; I anſwer, that they act not directly on the nerves, and that they are ſheathed by the nervous lymph, which ſerves as a vehicle to them. What confirms me in this opinion is, that there is no aliment throughout the vegetable or animal kingdoms, from which more or leſs of this ſpirituous fluid might not be extracted, and conſequently ſupply the body with the principle of motion.

Let us hence conclude, that the fluid of the nerves is compoſed of a two-fold ſubſtance: of a ſpirituous and extremely ſubtil part, called *animal ſpirits*; and of a gelatinous juice, diſtinguiſhed by the name of the *nervous lymph*.

This gelatinous lymph, ſerves as a vehicle to the animal ſpirits, and being aſſimilated with the nerves, is tranſformed into their ſubſtance and becomes ſolid, like the viſcous lymph of which the ſpider forms its web, when condenſed by the compreſſion of the air.

As it is evident that the nervous fluid is inſenſible, how can the nervous lymph, by being aſſimilated into the ſubſtance of the nerves, become a ſenſible ſolid? I muſt leave this phenomena to be accounted for by thoſe who may be willing to undertake the taſk.

With regard to the animal ſpirits, it is uncertain, whether a ſubſtance ſo ſubtil can be incorporated and become part of our ſolids. I incline to the negative, ſince no human art can fix it: it is moreover ſo volatile, that it could not be contained in any of our veſſels, unleſs confined by ſome viſcous fluid.

New Obſervations on the Structure of the Nerves.

All the functions of the animal œconomy are founded upon unalterable and uniform laws; we may however ſometimes obſerve phenomena in the human body, ſo very extraordinary, that they bear ſome reſemblance to thoſe ſingular appearances termed *luſus naturæ*.

We frequently ſee perſons, who, after loſing the uſe of their limbs, retain their ſenſibility *.

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* This is often ſeen in paralytics.

We ſee others, whoſe bodies though become inſenſible, yet preſerve their motion *.

Motion and ſenſe therefore have their diſtinct principles in the ſame organ.

On inquiring into the reaſon of theſe phenomena, facts oblige us to attribute them either to two different fluids, or to the ſame fluid contained in different veſſels of the ſame organ. But if we conſider, that the nervous fluid has one common ſource, the ſame filtre and the ſame reſervoir from whence it is impelled into the nervous fibres, we ſhall plainly perceive, that thoſe phenomena have not different fluids for their origin, but the particular ducts of the ſame organ.

The nerves, as it is well known, are the organs of ſenſe and motion: only the coats of their fibres are the organ †, and ſeat of ſenſe independently of their cavity, whether we conſider them as filled with

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* The caſe of a Swiſs ſoldier at Douay, who could perform his military exerciſe, but did not feel a large needle forced into the fleſhy part of his body, up to its extremity.

† See a preceding ſection, on the ſtructure of the nerves.

the medullary ſubſtance, as in the origin of the nerves, or with the nervous fluid, as in all the other parts of the body. Let us therefore conclude, that the cavity of the nervous fibres is the organ of motion; or, which is the ſame thing, that their ducts are the channels through which the fluid intended for action is conveyed.

Motion is then produced by the fluid which circulates through the cavity of the nervous tubes; and ſenſation by that which flows through the *fibrillæ* which compoſe the coat of theſe nervous tubes.

I ſhall therefore diſtinguiſh the ſame fluid into the moving *fluid* and the *ſenſitive fluid*; relatively to their different functions, and to the ducts of the nerves through which they circulate.

Of the Connection of the NERVOUS PARTS.

A violent blow on the head, though without fracturing the bones of the cranium, and without cauſing any ſolution of continuity in the texture of the ſolids, almoſt always occaſions a total proſtration of ſtrength, convulſive motions of the limbs, nauſeas, vomitings, ſometimes a general diſorder of all the functions of the machine, and a total extinction of ſenſe.

That ſimple commotion of the brain, and of the origin of the nerves, which is occaſioned by the rowling of a ſhip at ſea, commonly affects thoſe, who are unaccuſtomed thereto, with vertigos, vomitings, anxiety, paleneſs, proſtration of ſtrength and languor of the whole body.

The *effluvia* of odoriferous bodies, as of muſk, jaſmine, and roſe flowers, ſometimes affect delicate women with ſuffocations, ſincopes and faintings.

The corroſion of the ſmaller inteſtines by worms, frequently produces pains in the ſide, a cough, flux from the ſalival glands, dreadful cholics, vomitings, tremors, palpitation of the heart, convulſive motions of the whole body, a fever, dumbneſs, vertigos, the gutta ſerena, and the epilepſy, with its many dreadful ſymptoms.

What terrible diſorders enſue from the bite of a viper, of a mad dog, or the application of a cauſtic body to an excoriated nerve! Paleneſs, nauſeas, vomitings, difficult reſpiration, cold ſweats, convulſions, burning, and inflammatory fevers, retention of urine, ſyncopes, a ſpaſmus of the whole nervous ſyſtem, and univerſal numbneſs are the uſual concomitants.

Yet, when a ſharp or pointed inſtrument wounds a nervous part, and occaſions therein a ſolution of continuity, much worſe effects will enſue. A ſimple puncture of a tendon by a needle, is followed with the moſt deplorable ſymptoms: there are many other obſervations, which may be made, of this kind.

All theſe alarming phenomena are produced by the irritability of the nervous ſyſtem: the nerves we know are extremely ſenſible, they cannot endure the leaſt irritation; ſo that when any thing affects them with a painful ſenſation, either by compreſſing, ſtraining, wounding them and the like, immediately they contract and are convulſed. This contraction and convulſive motion are inſtantly communicated to the neighbouring parts, then to the next, and ſo ſucceſſively to all the parts, till they comprehend the whole; from whence enſue a conſiderable diſorder in the circulation, a very great diſtention and obſtruction of the veſſels, and a violent inflammation, with all the dreadful ſymptoms which accompany a diſordered ſtate of the functions of the animal œconomy. This is a freſh proof, that all the phenomena of this œconomy have ſenſe and motion for their origin, as has been already mentioned.

When we conſider in what manner the irritation of one part is communicated to all the others, we are obliged, by the facts, to admit a reciprocal correſpondency between them by the medium of the nerves; but the diſſecting knife, and the microſcope, make this connection evident to the ſight.

I ſhall not here deſcant on the wonderful connexion between the nervous parts; I leave that taſk to thoſe who are fond of the declamatory ſtile, and ſhall confine myſelf wholly to give a ſuccinct idea of it. I beg pardon of my readers, for detaining them on a ſubject ſo dry as this muſt neceſſarily be; I know how much it is my intereſt to preſent none but agreeable ſubjects, and to ſet off philoſophical enquiries with the embelliſhments of art; but this ſubject is connected with my work, and will admit of no foreign ornaments.

If we follow the nerves from their origin to their extremities, we ſhall obſerve them to branch out into infinite ramifications in paſſing from the brain, and in their diſtributions to the different parts of the body, ſomewhat reſembling the branches of a tree.

Here then we evidently ſee a double relation, ſubſiſting, on one hand, between every part of the body and the membranes of the brain; and on the other, reciprocally between all the parts of the body. As it is not ſufficient barely to mention theſe relations in the general, I ſhall offer an example of them.

Anatomiſts have diſtinguiſhed the nerves, relatively to their origin, into different claſſes, which they have ranged under different denominations: I ſhall make uſe of the common terms, that I may render my work intelligible to my readers, theſe parts not being any otherwiſe diſtinguiſhed.

The intercoſtal nerve is formed of three branches: the fifth, ſixth, and eight pairs, ſupply each a ſingle branch.

The branch of the fifth pair ſends out ramifications to the tongue, to the eye, to the jaws, to the cheek, and to the other parts of the face. The branch of the eighth pair, diſtributes ſome of its ramifications to the tongue, to the pharinx, to the œſophagus, to the ſtomach and to the lungs. The intercoſtal nerve alſo communicates in the cavity of the thorax, and abdomen, with ſome other ramifications of the eighth pair, and is augmented with ſome branches which riſe from the medulla ſpinalis, and paſs between the ribs. Thus we perceive a very intimate connection betwixt all theſe parts: this is the reaſon why aliments, which are ungrateful to the taſte, occaſion a nauſea and contraction of the œſophagus; why the touching of the root of the tongue with a feather, excites vomiting; and why wounds of the head, or a corroſion of the inteſtines by worms, occaſion difficult reſpiration, vomiting, a cough, dumbneſs, and dreadful convulſions of the whole machine.

Beſides the olfactory nerve, there enters into the noſe a branch of the ophthalmic. The communication of theſe two nerves is the cauſe why ſtrong ſmells excite tears, and a ſtrong light occaſions ſneezing: the ophthalmic nerve being joined to the nerves of the thorax when violently affected, excites, in the organs of reſpiration, the convulſive motion, termed ſneezing.

But this branch of the ophthalmic ends not at the organ of ſmelling, it is continued to the teguments of the *orbiculus naſi*, or tip of the noſe, whence it is reverted to the internal ſurface of the ſeptum. This branch ariſes from the fifth pair, as does the lingual maxillary: hence the reaſon why muſtard applied to the tongue cauſes a pungent ſenſation at the tip of the noſe, and excites a flux of tears. By this connection likewiſe, we may account for that titillation which is perceived in the noſe, when the worms contained in the inteſtines, corrode and irritate the membranes of theſe viſcera.

The nerves of the fifth and eighth pair, with the intercoſtal, ſupply the inteſtines and ſtomach: a branch of the fifth pair, as has been already obſerved, ſends forth its ramifications to all the parts of the face: a branch of the eighth, ſends forth part of its ramifications to the liver and biliar duct; whilſt the intercoſtal ſupplies the legs with the *anticum* and *poſticum*. The inteſtines are a continuation of the coats of the ſtomach; they have many nerves which are common to both, and by means of the meſenteric plexus, of the intercoſtal and the *par vagum*, communicate with all the membranes of the body. There is therefore an intimate connexion between theſe viſcera, and all the other parts of the animal machine: hence dentition occaſions vomitings, difficult reſpiration, ſuffocation, coughs, inteſtinal flux, fever, and univerſal convulſions. Hence, in the hypochondriac diſeaſe, the violent tenſion of the membranes of the ſtomach, occaſioned by the incloſed air, produces pains in the head and ſhoulders, vomitings, vertigos, dimneſs of ſight, languor, anxiety, palpitation of the heart, and a total diſorder of the vital functions. Hence coldneſs of the feet, and hurts of the extremities, bring on violent cholics, and ſometimes the *ſpaſmus cynicus*. This is the reaſon why the irritation of the ſtomach by corroſive poiſons, and of the inteſtines by worms, acrid bile, or draſtic purges, is followed by a convulſive hiccough, difficult reſpiration, dumbneſs, coughs, palpitation of the heart, pains in the ſide, vomitings, flux of the ſaliva, violent pains in the inteſtines, paleneſs, coldneſs in the extremities, univerſal tremor, retention of urine, a teneſmus, hollowneſs of the eyes, contraction of the lips, mouth, and other parts of the face, ſpaſms of the limbs, fever, vertigo, gutta ſerena, and many other dreadful ſymptoms.

I could enlarge upon this ſubject, but I fear I have already been too diffuſe. Should any of my readers be deſirous of more information, I recommend to him the peruſal of the Neurology of *Vieuſſen*'s and *Jenty*, where this ſubject is treated in its full extent: the obſervations I have made will ſuffice to eſtabliſh the following propoſition as a general law, which I ſhall make uſe of as I proceed; it is this.

All the parts of the body communicate with the membranes of the brain by the nerves, and with one another by common nervous ramifications.

Although all the parts of the body are connected with the membranes of the brain, that connection is not equal in every one. For ſeeing that the nerves are the productions of the meninges, and as their impreſſions are communicated by the motion of the nervous fluid, it is evident, that the more remote a nerve is from its origin, the leſs intimate that connexion muſt be: but ſuppoſing the diſtance to be the ſame, it is likewiſe evident, that the connexion of theſe two organs muſt be the more cloſe, when they have a greater number of nerves common to both. In a word, as the nerves do not form an uniform cylindrical duct, from the trunk to the extremity of their ramifications, and as a great number riſe from the ganglions, we may eaſily conceive, that the more a nerve ſhall form a continued whole, the greater will be the relation betwixt theſe organs. Thus there is no connection between the brain and the ſanguineous viſcera, the ſubſtance of which is purely vaſcular, ſuch as the liver, ſpleen, &c. neither can any ſenſation paſs to the *ſenſorium commune*, through their numerous circumvolutions.

Particular Obſervations on the Influx of the nervous Fluid into the Organs of Motion.

When you cut off the head of moſt animals *, you perceive the limbs to move for ſome time after the amputation: however, theſe animals ſoon die; their bodies, when deprived of their heads, after a few efforts, loſe their motion for ever. If this experiment proves the neceſſity of a connection of the muſcular parts with the brain, it proves likewiſe, that this connection is not eſſential to every motion in particular. Theſe motions therefore take place when there is not any inſtantaneous influx of the nervous fluid into the muſcles. Hence it appears, that this fluid continues for ſome time in the organ of motion, and to act needs not any impulſe immediately propagated from the brain. When once impelled into the muſcular fibres, it follows the ordinary laws of circulation; it continues there a ſhort time, and is then taken up by the lymphatics, or diſſipated by perſpiration.

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* Moſt perſons have ſeen a duck, when its head has been ſeparated from its body, run about for ſeveral minutes:

The continuance of the nervous fluid, in the muſcular fibres, is in proportion to the degree of viſcoſity of the nervous lymph. The more gelatinous that lymph

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nutes: a viper or ſnake will move a conſiderable time after decapitation; and flies, an entire day. Among all the animals, Man is that in which this phenomenon the leaſt appears.

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may be, the continuance will be the greater. Thus vipers, eels, ſnails and other animals, whoſe nervous lymph is extremely viſcous and very little perſpirable, are with difficulty deſtroyed. The caſe is not the ſame with animals of a ſanguine and hot temperament, whoſe liquors are extremely fluid, circulation quick, and perſpiration copious, as man, horſes, dogs, &c. In theſe the nervous lymph is very ſoon diſſipated, and there is a continual call for reparation. But in every ſpecies of theſe animals, the momentary independance, which is obſerved between the motions of the muſcles, and the influx of the nervous fluid from the brain, does not prevent the cauſe, which intercepts this connexion, from totally ſuppreſſing theſe motions at their ſource.

It is different with regard to thoſe animals, which have not any blood, and which have no brain, nor any organs of digeſtion, all whoſe liquors are nothing more than the nervous lymph itſelf, and that of a very glutinous conſiſtence; ſuch animals drawing their nouriſhment from the place to which they have been originally fixed, like the polypus and the oyſter: beſides, as no part of their bodies appears to want the aſſiſtance of the other, they can live after mutilation, and reproduce themſelves; ſo that from their very deſtruction they ſeem to derive the means by which they are perpetuated.

What I have juſt ſaid of the influx of the nervous fluid muſt, however, be underſtood only of involuntary motion: ſince the ſeat of the ſoul is in the meninges, the ſoul has no power over the body, after the head is ſeparated therefrom.

From the foregoing I infer, that if the obſervations here made prove the neceſſity of the connexion ſubſiſting between the head and the trunk, it is becauſe the head is the reſervoir of the nervous fluid.

Neceſſity of the arterial BLOOD *to* MOTION.

The nerves are not the only parts neceſſary to the functions of the muſcles: the arterial blood likewiſe contributes to their motion.

If the artery, which ſupplies a muſcle with blood, be cloſely tied above its inſertion, that muſcle will gradually * become paralytic; at firſt it will be numbed and ſtiff, and by degrees will be motionleſs. This experiment proves the neceſſity of the arterial blood to muſcular motion, and of the connexion of the heart with the muſcles by means of the arteries. The arterial blood is neceſſary to muſcular motion as an immediate cauſe, but not as an inſtantaneous one; ſince the muſcle, in the foregoing experiment, continues its motion many minutes after the influx of the blood is intercepted.

But how does the arterial blood conduce to the motion of the muſcles? To me it appears to be done many ways.

We know that the cold air renders the fibres numb and ſtiff by fixing their fluid; this fluid therefore hath occaſion for heat; and as the blood in circulation is the principle of natural heat, it is therefore certain, that the nervous lymph requires the circulation of our fluids, in order to preſerve the fluidity neceſſary to the functions of our organs. The arterial blood therefore is aſſiſtant to muſcular motion, as being the principle of heat. It is ſaid, that the heat of

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* In ten, fifteen, or twenty minutes, according as the animal may be poſſeſſed of blood, ſtrength, &c.

fire does not reſtore motion to paralytic muſcles. We are to obſerve, that the heat of fire is not a ſuitable ſubilitute; the heat of the blood is diſſolvent, and adapted to liquify the gelatinous lymph; the heat of fire is only calculated to dry it: therefore it is not at all ſtrange, that the heat of fire, ſubſtituted in lieu of the heat of the blood, does not reſtore life to paralytic muſcles. But ſuppoſing this to be a ſuitable ſubſtitute, what will thence follow, but that the arterial blood is not aſſiſtant to motion, merely as the principle of heat? Let us enquire then in what other manner it can be aſſiſtant thereto.

It is certain, that the nervous fluid is the principle of vigor and of ſtrength to the body, that the *cerebrum* is its filtre, and the *cerebellum* its reſervoir. It is certain, likewiſe, that ſome animals, like the mule and the aſs, poſſeſs extreme ſtrength, and endure fatigue for a conſiderale length of time; yet the cerebrum and cerebellum of theſe animals are very ſmall, if compared to the ſame parts in Man, and in many other animals, which poſſeſs a much ſmaller degree of ſtrength. Whence does this proceed, but from ſome difference in the formation of the organs of motion, or in the liquors which ſupply the nervous fluid? To diſcover this diſſimilitude, let us chuſe, from among quadrupeds, that animal which neareſt reſembles a mule, as for inſtance, the horſe; let them be of the ſame age, the ſame ſize, and, as far as it is poſſible, be both equal.

On comparing theſe two animals without diſſection, we perceive at firſt ſight a very great diſſimilitude. The limbs of the mule are ſmaller than the limbs of the horſe, the head longer, the legs ſmaller and of a greater length, and the ſides leſs protuberant. On examining the internal parts, we find the muſcles of the mule ſmaller than thoſe of the horſe, but its vaſcular ſyſtem larger, the lungs of greater bulk, and the ſolids of a ſubſtance ſomewhat more compact. The cauſe of its greater ſtrength, ariſes then principally from its having a greater ſupply of nervous lymph from the maſs of its fluids. The blood of thoſe animals ſupplies the nervous fibres with a greater quantity of this active fluid; this ſubſtitute is neceſſary in thoſe large bodies, whoſe motions are conſiderable, and brain very ſmall, and conſequently incapable of ſupplying any great quantity of it. This is the caſe of almoſt all quadrupeds; they have a large quantity of blood, large lungs, and an abundant ſupply of the nervous fluid. On the contrary, in all the animals which have only the gelatinous lymph, this ſubſtitute, which is extracted from the blood, and even the blood itſelf, is not any ways neceſſary; nor has nature ſupplied them with it.

Let us proceed yet farther, and endeavour to prove by ocular demonſtration, what we have now been advancing on the teſtimony of facts.

We have ſaid, that the nerves are the organs of motion; but the muſcles are ſo in a more particular manner.

In a muſcle we diſtinguiſh its body and its two extremities; the body of a muſcle is entirely carnous; one of the extremities, which is commonly termed the head of the muſcle, is almoſt an entire fleſhy ſubſtance; the other extremity, called its tail, is perfectly tendinous.

The body of the muſcle is compoſed of many *faſciculi* of fibres, ranged in two different orders.

Each of theſe orders is enveloped with its peculiar membrane, and the entire muſcle with a common coat, which combines the whole. Every one of theſe *faſciculi* is compoſed of muſcular fibres, ten times ſmaller than the fineſt hair, as is obſerved by *Muys* and *Lewenhoeck*.

When examined by the microſcope immediately after they are extracted from the body of a living animal, theſe fibres appear to be formed of veſicles, and reſemble a tube full of a limpid liquor, alternately compoſed of globules of liquor, and globules of air. See fig. 1.

After theſe globules have diſappeared, and the liquor is either congealed or diſſipated, the fibre appears to have an uniform cavity, but filled with a kind of reticular web, formed of many little cells adjoining to each other, and united by many tranſverſe *fibrillæ*. See fig. 2.

The muſcular *faſciculi*, examined with the microſcope, appear to be formed of many parallel contiguous fibres, bound together by a number of filaments, and much reſemble a net. Theſe fibres form anaſtomoſes, and are blended in many places after the ſame manner with the cellular threads in the diviſion of the interior part of a fibre, as repreſented in fig. 2. The net, which combines the muſcular fibres, appears to be formed of ramifications of nerves, arteries, and the veſſels which enter the muſcle. Theſe veſſels and nervous ramifications in particular, when they enter that organ, appear to be diveſted of part of their external coats *. So that the general covering of the muſcle is formed of the coats of the firſt ramifications, and cellular membranes of the neighbouring parts: the covering of the *faſciculi* of the firſt order is a continuation of the coats of the ramifications of the ſecond: the covering of the *faſciculi* of the ſecond order is a continuation of the coats of the ramifications of the third; and ſo of the reſt.

It appears, likewiſe, that the laſt ramifications or nervous *fibrillæ* themſelves, which are the ducts continued from the *pia mater*, form anaſtomoſes with the muſcular fibres which they unite to and increaſe, impelling at the ſame time into the cavity of theſe fibres that fluid which they contain. But theſe ramifications, when diveſted of their external coat, form not the muſcular fibres: it is very evident from the diſſection of the muſcles, that they are already formed before the nerve enters them. In the muſcle of the eye, for inſtance, the branches of the third, fourth, and ſixth pairs, are inſerted at a great diſtance from the origin of theſe muſcles; and that portion of them, which is above their inſertion, cannot have been formed by theſe nerves, all whoſe fibres tend toward the eyes. But if that portion has ſome other origin, the whole muſcle muſt have the ſame likewiſe: ſince the coat of that organ is only a continuation of the fibres of that part, and that portion itſelf is evidently the continuation of a tendinous expanſion of the *perioſteum*, the fibres of which, being dilated and united to the vaſcular and nervous ramifications, form that fleſhy ſubſtance, called the belly of the muſcle, and which is properly the organ of motion.

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* Viz. Thoſe which they receive from the *dura mater*.

It is obſerved, that the muſcular fibres, when they approach a tendon, are directed to it as to a centre; and it appears, that the whitiſh ſubſtance, which commonly terminates a muſcle, is a continuation of the carnous fibres of its body, whoſe ſubſtance is too compact to admit the red part of the blood.

We may perceive likewiſe, in diſſecting a fœtus, that the extremities of the muſcles are a continuation of the perioſteum; the ſame may be remarked in adults, when the parts have been macerated in water; and it is known, that the perioſteum takes its origin from the *dura mater*. Beſides it is evident, that the branches of the nerves, which are inſerted into the muſcles, have not a ſufficient ſubſtance to form organs of ſo large a bulk. The muſcle is therefore a part entirely nervous, and receives its origin mediately or immediately from the *dura mater*.

Nothing is more ſimple, than the formation of theſe organs by the nervous fibres. When theſe fibres are ſo compact as not to receive the red part of the blood, and admit the fluid of the nerves only, they form the white ſubſtance at the extremity of the muſcle. But when their diameter is ſufficiently large to receive a great quantity of the nervous fluid, and when their interſtices are ſufficiently dilated to admit the reticular plexus of nerves, ſmall arteries and veins, which covers and unites them, they form the muſcular fibres which compoſe the body of the muſcle. This formation is very evident in the frontal and occipital muſcles, in thoſe of the outward ear, in thoſe of the face, and in the muſcular fibres of the ganglions.

It is proved by injection, that the blood veſſels extend their ramifications through the whole ſubſtance of theſe fibres. If the arteries of a muſcle be injected with any coloured oily liquor, the liquor will ſomewhat dilate the muſcle, but will not be perceived in the cavity of the fibres, for they ever retain their tranſparency.

The fibres of a muſcle nevertheleſs increaſe in bulk, which could not be unleſs they received a ſubtil lymph by their fibrillæ. The ſanguiniferous veſſels therefore diſcharge into the cavity of theſe fibres a ſpirituous lymph analogous to that of the nerves.

Hence the arterial blood conduces to muſcular motion, as the cauſe of that heat which is neceſſary to the fluidity of the nervous lymph, and as the ſource of that ſpirituous lymph which is ſubſtituted in place of the nervous fluid. It is by this mechaniſm that the ligature of the artery, which is inſerted into a muſcle, deprives that muſcle of its motion; but it is not certain that this is owing to theſe cauſes only. It may be, that the ſanguiniferous veſſels of this muſcle, when relaxed by the ſuppreſſion of the arterial blood, having leſſened the bulk of this muſcle, continue it in a relaxed ſtate, and prevent the free courſe of the nervous fluid into its ducts.

Or perhaps a compreſſion of the nerve, above its inſertion into the muſcle, occaſioned by the diſtenſion of the obſtructed artery, prevents ſuch an influx. Whether it be ſo or not, the two reaſons, which we have drawn from the neceſſity of the arterial blood to muſcular motion, are ſufficient to eſtabliſh the conſequences which I ſhall deduce therefrom in the remaining part of this work.

Hitherto I have not examined the body as relative to the organs of ſenſe and motion, but in a general manner: I now proceed to a more particular examination.

Of the different Motions of the BODY.

We diſtinguiſh at firſt ſight in every animal, but more evidently in Man, two different kinds of motion; the purely voluntary, and the purely mechanical.

Voluntary motions have a character ſufficiently diſtinct, without our undertaking to explain them; as to involuntary motions, we muſt range them into this order, viz. the action of the organs of life, and the action of the organs of digeſtion: we may here likewiſe range the functions of thoſe organs, which preſerve the body in a ſtate of health, all thoſe motions which follow every particular attitude of the body, in ſhort, all which are the effects of the action of external objects on the machine, ſuch as convulſions, ſpaſms, &c.

I have already ſhewn, that the nervous fluid is the principle of motion; but although this fluid be the immediate agent in all the motions of the body, it acts not always in the ſame manner: at one time it is independent in its operation, at other times it is ſubordinate to the ſoul. I would extend my arm, and immediately my arm is extended; but ſhould I will that my pulſe ſhould ceaſe to beat, and my heart diſcontinue its motion, ſuch a volition would avail nothing; my pulſe will continue to beat, and my heart retain its motion, independent of my will, and in oppoſition thereto. In the firſt caſe, I perceive a power which commands, and a power which obeys: in the laſt, I perceive a power which acts independently, and even contrary to the will of the commanding power.

Let us here dwell for a moment on theſe conſiderations, and we may draw from them theſe concluſions, which we ſhall lay down as general laws of the mechaniſm of the human body.

In all voluntary motions, the nervous fluid is ſubordinate to the ſoul, and becomes the inſtrument ſhe uſes in performing them.

In all involuntary motions the nervous fluid is the principal agent, and, combined with the various organs which it animates, performs independantly all theſe motions.

And here, if I might be allowed to make a ſhort digreſſion, I would obſerve, that in this law, which renders the life of the body independent of the ſoul, appears the tender care of Nature, anxious, if I may uſe the expreſſion, to preſerve its work.

Whilſt we live upon this earth, where our exiſtence is neceſſarily divided betwixt pleaſure and pain, what man is there who does not, in thoſe moments of ſadneſs and diſappointment, which ſo frequently aſſail us, impatiently wiſh for a diſſolution; and who would not ceaſe to live, if his exiſtence depended upon a ſingle act of the will? By not permitting us thus to terminate our miſery, Nature has wiſely reſerved to us the means of recovering the wonted equilibrium of our minds; and by the ghaſtly and terrifying form of death, eſpecially a violent one, inſtead of a propenſity, ſhe has implanted in us an horror of ſuicide; and preſerves our being by an unconquerable antipathy to pain.

I have diſtinguiſhed in every animal two kinds of motion, the one purely voluntary, the other altogether mechanical; but he muſt never have made any obſervations upon Man, who has not obſerved many actions, which cannot be ranged under either of theſe claſſes. Among theſe are bodily habits, occaſioned by the ſame ſeties of motives frequently repeated in the ſame order, either accidentally or with deſign—Such as thoſe habits we contract by art. Among theſe are the actions of thoſe whom we ca[illegible] *abſent men*, the gait or walk of a perſon whoſe mind, being intent upon any ſubject, attends not to his ſteps; and that motion, which tends to preſerve the *equilibrium* of the body, when we ſtumble, or any way incline from the center of gravity; ſtartings from a ſudden and violent noiſe; the different lineaments which the paſſions impreſs on the countenance, and the imitative motions we perform, whilſt looking upon the actions of an ingenious mimic *. All thoſe actions, which philoſophers conſider as purely mechanical, are nevertheleſs not entirely ſo; nor is Man in this reſpect a ſimple *automaton*: yet theſe actions are not purely voluntary, but of a particular kind.

A performer on the violin combines the moſt diverſified movements, and performs them in a manner extremely exact, without giving the leaſt attention to any one in particular.

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* By attending to the action of a good mimic, the body of the ſpectator mechanically follows the ſame motions: our geſtures imitate the geſtures of thoſe who appear to be affected by any of the paſſions, although we are not conſcious thereof.

All theſe movements are performed by an infinite number of ſmall muſcles, which the will has power to ſet in motion, but which in this caſe do not ſtay for its command* Obſerve, however, that it is by an act of the will, that the performer determines to play any particular tune: here it is neceſſary that the ſoul firſt ſet the whole machine in motion; the reſt follows without its concurrence in any ſhape. The caſe is the ſame in the gait or walk of a perſon, who is intent upon his ſubject, but not upon his ſteps. In all theſe inſtances, the motions are partly voluntary, and partly mechanical.

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[*] When the performer firſt begins to practiſe theſe motions, he has occaſion for the action of the will every moment, to diſpoſe them in their proper order, and his ſoul is ſcarcely able to direct ſo prodigious a number of muſcles, which in this caſe act clumſily and irregularly. If the action of the will no longer appears, when the execution becomes eaſy, it is not becauſe it cannot eaſily be diſcovered amidſt the inconceivable rapidity of its operations; but becauſe it really acts not any more.

An obſervation, which muſt doubtleſs have occurred to the reader, is, that our organs not only perform ſuch motions, but are ſo many mechanical inſtruments, which are ſet in motion by the other faculties of the ſoul: for not only the will gives the firſt impulſe to our organs; every different faculty of the ſoul acts on them in its turn; ſometimes they are wrought on by ſenſibility, ſometimes by inſtinct, and ſometimes by the imagination: whence it follows, that the nervous fluid is immediately ſubject to every one of theſe faculties.

In thoſe ſtartings, which are occaſioned by any ſudden and violent noiſe, in the lineaments which are impreſſed on the countenance in the different paſſions, in that oratorial action which accompanies an animated ſpeech, it is the ſoul, or rather it is its ſenſibility only, which agitates the body.

In thoſe loathings and antipathies which ſeize us at the ſight of any offenſive aliment, in the horror excited by any ſhocking action, it is the imagination which affects our inteſtines, and occaſions convulſive motions in them.

The motions which tend to preſerve the equilibrium of the body, when it inclines from its center of gravity, and the actions of an infant, which precede all knowledge, and even the gradual unfolding of the intellect, have their ſource neither in the will, nor in the imagination; and ſpring neither from ſenſibility nor from mechanical laws, but from inſtinct acting on our organs.

Let us admire the wiſdom of Nature's laws, ſeen in the manner wherein the different ſpiritual faculties of Man concur to all his actions.

Without this wonderful concurrence, to what a ſtate ſhould we be reduced? Continually obliged to call in the will and the underſtanding to direct our bodily actions, and even our minuteſt motions; our lives would be at an end before we could accompliſh any one purpoſe: nor would the ſoul, thus ſubſervient to the neceſſities and motions of the body, have leiſure to enlarge its faculties; and thoſe noble endowments, this *divinæ particula auræ*, would have remained for ever in a ſtate of inaction. How much time is ſaved, and how much irkſome perplexity avoided by theſe wiſe laws! Has Man an inclination to act? No more is required than a ſimple impulſe of the will, a ſingle reſolve of the mind, and it is done!

I ſhall conclude this article, with ſome particular obſervations on voluntary motions.

We can, in obedience to the will, contract or relax a muſcle with aſtoniſhing celerity, or by gradations more or leſs protracted. How does the nervous fluid produce that ſurprizing action of the muſcles, in which motion and reſt alternatively ſucceed each other in the ſame inſtant? This problem, if it can be reſolved, is not connected with my preſent ſubject.

We have ſeen that a ligature of the duct of the *medulla ſpinalis*, is followed by a paralytic affection of all the parts of the body which are ſituated below it; that the ſoul cannot then contract nor relax any of the muſcles of theſe paralytic parts; we have ſeen that the ſeat of the ſoul is in the meninges; *all voluntary motions are therefore made by the inſtantaneous influx of the nervous fluid into the muſcles.*

I beg the reader to conſider this not in the light of an hypotheſis, but as an unqueſtionable truth eſtabliſhed upon facts. Some pretend, nevertheleſs, that this inſtantaneous influx is a chimera; "Since, "ſay they, animals have been ſeen to live, "walk, and perform all their functions "after their heads were taken off." But what they ought to have done, but did not dare to undertake, was to have ſhewn in all theſe pretended functions, ſome act of volition, ſome action which had an aim or ſcope, or which tended to ſome viſible end. Animal life, is a function independant of the ſoul; and walking or flying, when they have no tendency to any end, are no more than continuations of motions which are purely mechanical, and are produced in this caſe by the convulſions of an irritated ſenſible ſubſtance?

Another obſervation which depends upon the preceding, and which we ſhall apply hereafter, is, that all involuntary motions, ſuch as thoſe which conſtitute life, being independant of the immediate influx of the nervous fluid, *there is required a leſs quantity of that fluid to perform them, than to perform thoſe which depend on a determination of the will.*

We might likewiſe confirm this truth by the force of the contraction of the organs allotted for voluntary motion, compared with the force of the contraction of thoſe organs which perform only mechanical movements. That the force of this contraction is proportioned to the quantity of the nervous fluid, may be proved from the ſtrength of animals, in which this fluid abounds, compared with the langour of a body which has been deprived of it. This is the reaſon, why, in aged perſons, life ſurvives the total extinction of ſtrength, and why, in bodies worn out by ſickneſs, the organs of life are the laſt which loſe their motion.

Of the organic Elaſticity of the Fibres.

The organs of motion are compoſed of muſcular fibres, which are themſelves compoſed of organic fibres, or fibrillæ.

During the life of any animal, the nervous fluid, which is continually circulating through its fibres, fills them to a certain degree, ſupporting their coats which are thus in a certain degree of tenſion. This continual tenſion is termed *the natural tone of the ſolids.*

By the elaſticity of their fluid, they reſiſt or give way to any power which endeavours to extend or compreſs them.

Now this reſiſtance in the fibres to extenſion, and to the preſſure of objects, with the power of returning to their primitive ſtate, is called *organic elaſticity*: a property of the ſolids which muſt be carefully diſtinguiſhed from their primitive elaſticity or ſimple reſiſtance of the elementary parts of the fibres to their diſunion. This latter is a property common to matter in general; whereas the former is the effect of the ſtructure of the fibres, combined with the action of the fluid which fills the cavity of the nervous tubes and alſo the cavity of their fibrillæ.

Of the ORGANS *of* MOTION, *conſidered relatively to their different Degrees of primitive Elaſticity.*

I will not now ſpend time in determining the form, the figure, and the diameter of the ſimple fibres, which compoſe the fibrillæ of organic fibres; this is more than I dare undertake: I will only obſerve, that the elaſticity of the fibres * which form the ſubſtance of the nerves and muſcles, is proportioned, like that of all elaſtic bodies, to the form of their conſtituent parts, to the denſity of their ſubſtance, and to their diameter; in a word, to their geometrical dimenſions.

Let us leave that undeterminable queſtion concerning the infinite diviſibility of matter; whatever may be the configuration of the elementary parts of bodies, it is certain, that there is a configuration of parts, which ſtrictly follows geometrical dimenſions. The more oblong theſe particles are, and the more they incline to an acute angle, the greater is the reſiſtance they make; the leſs eaſily they can be ſeparated

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* The nerves are extremely elaſtic, although certain philoſophers affirm the contrary. Their elaſticity very evidently appears, upon inſpecting a nervous ramification in an extended muſcle. It is perceived, by depreſſing the carnous parts of the body in a ſtate of health; but eſpecially by examining fibres which are affected with a ſlight inflammation. The gelatinous ſubſtance of which they are formed, and into which they are reſolved, is extremely elaſtic; and are not the ſtrings of muſical inſtruments which are ſo exceedingly elaſtic, nervous ſubſtances?

ed one from another, the more elaſtic the ſubſtance they compoſe will be *.

For the ſame reaſon, the more cloſely the particles, which form any body, are united; the greater reſiſtance it makes, and the more elaſtic it will be.

This very evidently appears in all bodies, which greatly abound with lymph: paper, when ſoaked in water, is lax and ſoft, but its elaſticity returns when the water is evaporated.

It is the ſame in regard to metals; by much beating, they are rendered more elaſtic. It is evident, in air of different temperature: and cold by condenſing bodies, increaſes their elaſticity; whilſt, on the contrary, heat dilates them and weakens it.

In their enquiries into the firſt elements the ſolid parts of the body, phyſiologiſts have ſuppoſed all theſe organs to be formed of many minute nervous fibrillæ, and have inferred from the evidence of facts, that theſe fibrillæ are compoſed of others much more minute, but without

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* I beg my reader to remember, that I ſuppoſe an equality of the terms of compariſon, although I do not conſtantly expreſs it.

cavity, reſembling the filaments of ſkins, which have been reſolved by maceration.

They aſſign theſe fibrillæ without a cavity, as the firſt elements of our fibres; but it is evident, that they have for their principles the ſame elements with the nervous lymph, whereof all our ſolids are compounded.

The ſubſtance of the nerves and the muſcular fibres being homogeneous, we may readily comprehend, that the different degrees of elaſticity, deduced from the configuration of the elements of bodies, is not to be included in our calculation. As to the combination of theſe different elements, it is certain, that the more compact the ſubſtance of the ſimple fibres, and of the fibrillæ of the nerves, the more elaſtic they will be. This truth, which is confirmed by conſtant experience, is evident from theory itſelf: but thoſe which are to be deduced from geometrical dimenſions are leſs evident, they appear not at firſt ſight, and are not diſcovered without the aſſiſtance of art.

The laws of the elaſticity of bodies, which regard dimenſions, are little, if at all known. This matter, I believe, has not been yet treated of by any one; I ſhall attempt to determine theſe laws in a clear and conciſe manner, but to perform it with the greater ſucceſs, it will be neceſſary to examine the ſubject in its fulleſt extent.

In two bodies, the leſs the diameter of the one, the length in both being the ſame, ſo much leſs is its ſtrength: alſo, the leſs the length of one of two bodies, their diameters being equal, the greater will be its ſtrength. Becauſe the elementary parts of bodies make leſs reſiſtance in proportion as they are leſs ſolid; and the leſs extended a body is in length, the more equal will its denſity be in every part; ſo that it makes, in all reſpects, a more equal reſiſtance, and conſequently yields the leſs to the preſſume of any power acting upon it. This is the reaſon why a ſpherical figure is the ſtrongeſt poſſible.

Philoſophers have deduced from theſe obſervations the ſame conſequences with regard to the elaſticity of bodies, which we have drawn from them in regard to their force; to me it appears, that, in this reſpect, they have greatly erred.

By *elaſticity*, I mean that property by which certain bodies return to their primitive ſtate, when the power which compreſſed them ceaſes to act on them.

Elaſticity then is to be eſtimated by the difference between the ſpace, occupied by a compreſſed body under preſſure, and that which it occupies when the preſſure ceaſes; and by the ſpace which the extremities of a body extended longitudinally, move from their natural poſition, and not by the reſiſtance they make to this preſſure. Otherwiſe a large oak, which the ſtrongeſt wind has not power to bend, would be more elaſtic than the reed, which yields without reſiſtance to the ſlighteſt breath of air, and always returns to its former erect poſition. Or, to make uſe of another example, a bar of ſteel, which the ſtrongeſt arm cannot bend, ſhall be more elaſtic than the ſpiral ſpring of a watch, which eaſily yields to the action of the moving power, and retains for many years its property of always returning to its primitive ſtate. That body therefore is the moſt elaſtic, which yields the moſt to the preſſure of any power, and on which that power leaves the leaſt impreſſion.

Not only the conſequences are falſe which have been deduced from the obſervations here given, but there appear between the force of a body which depends on its dimenſions, and its primitive elaſticity, relations of a quite contrary nature.

It is certain, that a ſpherical figure is the ſtrongeſt; but take a body whoſe ſubſtance is the moſt elaſtic, as for inſtance, ſteel, faſhion it into a globular form, and try if you can perceive in it the leaſt elaſticity.

A tennis ball can be no exception, it being an heterogeneous ſubſtance, compoſed of an infinite number of rectilinear and curvilinear longitudinally extended bodies, wound one upon the another, and included within a common covering. A bladder diſtended with air is not more concluſive; for we are here ſpeaking of ſolids, not of fluids. It will be equally impertinent to ſay, that a ball of marble, when forcibly impelled againſt another body of the ſame nature, rebounds with great force. Even ſuppoſing I cannot aſſign any reaſon for this phenomena; what will you be advantaged thereby? It is plain, that to form a concluſion ſubverſive of the principle here eſtabliſhed, you muſt prove that this phenomenon ariſes from the elaſticity of the ball of marble, and muſt be attributed to its ſpheric form, and not to the air as a medium, nor to any other cauſe.

But take another piece of ſteel, its length being three or four times its diameter, and you will perceive a ſmall degree of elaſticity. Lengthen this cylinder, preſerving the ſame diameter, and you will perceive in every one the elaſticity to increaſe with this dimenſion. Select any elaſtic body you pleaſe, the reſults will be always the ſame. The elaſticity of any body therefore increaſes in proportion as its ſtrength diminiſhes.

From this obſervation I lay down theſe two conſequences, as demonſtrative principles: 1. That, *In nervous fibres of an equal length, that which has the leaſt diameter has the greateſt elaſticity; and among thoſe of an equal diameter, that which has the greateſt length has likewiſe the greateſt elaſticity* *.

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* To prove the contrary, the inſtance of a watch ſpring may be adduced, its elaſticity being increaſed by

Finally, an obſervation which at firſt will appear ſurprizing, and which is the reſult of the preceding, is, *that the elaſticity of a body of a large diameter is augmented in proportion to the looſe connection of its conſtituent parts.* Hence the reaſon why the organs of aged perſons, by a continual aſſimilation of the nervous lymph, become rigid and very little elaſtic. Hence likewiſe it is, that in perſons of an advanced age, the uſe of emollient liquors dilating the pores of the ſolids, ſomewhat reſtores their elaſticity.

Such in general are the laws of the elaſticity of bodies dependent on their dimenſions.

by the cold, altho' it is nevertheleſs ſhortened. This obſervation is juſt, but the conſequence falſe. It is not by ſhortening this ſpring that the cold increaſes its elaſticity, but by rendering its ſubſtance more compact. By being ſhortened, its elaſticity certainly is leſſened; but is augmented by its ſubſtance being rendered more denſe. Thus the cold produces on elaſtic bodies two different effects, and on comparing them, we perceive, that elaſtic bodies gain thereby more than they loſe; for, in order to weaken their elaſticity, the cold acts only on one dimenſion, but to ſtrengthen the elaſticity, it acts upon all.

Of the different Degrees of the organic Elaſticity of the FIBRES.

This elaſticity varies with the quality and quantity of the nervous fluid. We muſt conſider the quality of the nervous fluid in two different points of view, viz. relatively to its purity; and relatively to the proportion of the ſubſtances which compoſe it.

It is certain, that the fluid of the nerves is not equally pure in every individual. Notwithſtanding the extreme delicacy of the fibres, through which it is ſeparated, it mixes with foreign matter extremely ſubtil, but of a different nature, and only adapted to render it leſs pure and leſs active.

If you examine a body after the taking of a ſtrong narcotic, you will obſerve the pulſe become weak, the reſpiration difficult, the head heavy, the ſenſes dull, and all the organs in a ſtupor. Theſe different effects muſt be occaſioned by ſome ſulphurous principle, which exhales from narcotics, and corrupts the nervous fluid at its ſource.

That ſulphurous particles exhale from narcotics, is evident from divers experiments. Their vapours have the ſame ſcent, with the vapour of ſulphur: acids prevent their ill effects, as it does thoſe of all ſulphurous ſubſtances. The action of fire deprives them of their qualities; and applied externally to the head, or ſoles of the feet, they produce the ſame effect as when taken inwardly.

Here we ſee that the purity of the nervous fluid is deſtroyed; and theſe effects of narcotics are alſo produced by many other medicaments. The inſorption of the pus, in ſuppurated wounds, by which the nervous fluid is depraved, occaſions an oppreſſion of the ſpirits. The vapours which exhale from gold or ſilver mines, and the effluvia of infected air, produce the ſame effects.

This is the reaſon why formerly all animals languiſhed, that approached the *lacus averni*. They who dwelt near it were weak and diſeaſed, and their complexion pale and livid. The beaſts gradually loſt the uſe of their limbs, and putrification preſently enſued. The birds no ſooner approached this infected atmoſphere, than they ſeemed to have loſt the power of flying. The moment they felt the effects of theſe deſtructive exhalations, their wings loſt their elaſticity;

their bodies, their ſtrength; and they fell dead into the waters.

Not only external bodies deprave the fluid of the nerves; but the fluid, if ever ſo pure, becomes vitiated, when it continues in the body a conſiderable time without motion.

This is evident in continent perſons, from the ſtupor which is occaſioned by corrupted ſemen. When the teſticles of a bull have been compreſſed, and the ſeminal veſſels rendered incapable of performing their functions, the parts adjacent to the matrix of the cow are covered with ulcers and carnoſities, from the diſcharge of corrupted ſemen in coition. From theſe obſervations, let us lay down this general rule.

The purer the nervous fluid is, the better it is adapted to the motion of the body, and the greater is the organic elaſticity of the fibres.

The nervous fluid is a compound, formed of an extreme ſubtil ſpirituous liquor, which is the principle of motion, and a gelatinous lymph which is likewiſe extremely ſubtil, and ſerves as a vehicle to the animal ſpirits, to fix them and regulate their action.

The nervous lymph has a much greater ſhare in the compoſition of this fluid, than the animal ſpirits, but not always in the ſame proportion, nor has it always the ſame conſiſtence, nor the ſame fluidity.

If we conſider but for a moment the functions of the animal ſpirits and nervous lymph, we ſhall eaſily perceive, that the fluid of the nerves muſt produce very different effects, according to the different combination of theſe liquors.

If the animal ſpirits be ſupplied to the nervous fluid in too ſmall a quantity, the organic elaſticity of the fibres will be extremely weak; if in too large a quantity, they irritate the ſenſibility of theſe organs by their pungency, as ſtyptics, when they are applied to excoriated parts of the body, render them rigid. The fluid of the nerves therefore does not give our fibres all their elaſticity, except when it is combined with the nervous lymph in a juſt proportion. Hence let us conclude, that the more fluid the nervous lymph is, the more inſtantaneous the action of the ſame fluid will be.

The more this lymph abounds in the nervous fluid, the weaker and more languid is the tone of the fibres. On the contrary, the greater the quantity of the animal ſpirits, provided that quantity be not ſo exceſſive as to occaſion rigidity, the more powerful is its action, and the ſtronger the elaſticity of the fibres.

I ſhall now examine the organic elaſticity relatively to the quantity of the nervous fluid, its quality being the ſame.

As our fibres are hollow cylinders, formed of planes of parallel *fibrillæ*, let us view the phenomena which reſult from their ſtructure, relatively to the quantity of the fluid which pervades them. When exhauſted of their fluid, the fibres are then relaxed, and entirely deſtitute of organic elaſticity.

Inſtead of being entirely exhauſted, ſuppoſe, in theſe ſame fibres, a ſmall quantity of nervous fluid, they will not be then ſo much relaxed, and will poſſeſs ſome ſmall degree of organic elaſticity.

But if the fibres abound with their fluid, and that not in too great a degree, they will yield to the impreſſion of objects, their re-action will be ſtrong, and they will have their full organic elaſticity.

However, to attain that end, the quantity of the fluid which pervades their fibrillæ, and that which pervades the tubes they compoſe, muſt be proportionate.

When this fluid is in too great, or too ſmall a quantity in the tubes, it compreſſes too powerfully, or too weakly the fluid contained in the fibrillæ. In this caſe the coats of the fibrillæ are ill ſupported; in the other caſe they are rigid, and in both, the organic elaſticity is very imperfect, and *vice verſa.*

Finally, ſuppoſe theſe fibrillæ diſtended to exceſs by their fluid, they will then oppoſe a very great reſiſtance to the action of any power; their re-action will be weak and difficult; in a word, they will be in a manifeſt ſtate of rigidity.

We may therefore conclude, that there are almoſt infinite degrees of organic elaſticity, whereof relaxation and rigidity are the extremes, and the moſt perfect tone the middle term.

The original elaſticity of the fibres varies likewiſe with the different ſolidity of their coats.

When too lax or too thin, their coats yield too eaſily to the action of the nervous fluid, and re-act but with little force.

When too ſolid, they difficultly yield to the action of that fluid, and re-act likewiſe but weakly. The medium, or a moderate degree of ſolidity, is therefore beſt adapted to communicate the due tone to our organs.

The Organs of SENSE, *conſidered with regard to their different Degrees of Senſibility.*

I ſhall here ſubjoin ſome obſervations, on the organs of ſenſe; and firſt let us endeavour to diſcover upon what principles the force of our ſenſations depends; and ſince we cannot eſtimate the different degrees of the ſenſibility of our organs by intuition, let us deduce ſome rules from comparative anatomy, whereby we may be enabled to form a judgment of them. Theſe rules muſt be drawn from the nerves. As theſe organs have ſo conſiderable a ſhare in the phenomena of human nature, we cannot examine them too cloſely, in order to become perfectly acquainted with their ſtructure.

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The nerves are the productions of the meninges with which they unite, and form one ſubſtance. On examining the ſtructure of the nerves by the niceſt diſſections, we obſerve that the meninges are formed of two lamellæ, and that each of theſe lamellæ has a duplicature, and its particular veſſels, which never appear but when theſe membranes are inflamed.

The lamellæ of the *dura mater* ſupply the nerves with two thick and ſolid coats; the lamellæ of the *pia mater* ſupply them with two coats likewiſe, but of a thinner ſubſtance.

If we attentively trace the nerves from their origin, we may obſerve, that they always diveſt themſelves of the membranes which they receive from the *dura mater*, when they form any organ of ſenſation, where exquiſiteneſs is neceſſary; and even ſometimes they diveſt themſelves of the external lamella of the *pia mater*, when that organ requires a ſuperior degree of ſenſibility: this is very evident in the ſtructure of the eye.

The lamellæ of the *dura mater* cover the lamellæ of the *pia mater*. The lamellæ of theſe membranes are united by a cellular web; the interior lamellæ form a reticular film, whoſe cells are replete with the nervous fluid.

When the nerve diveſts itſelf of its exterior coats, to form any organ of ſenſation, this cellular web, which I have juſt mentioned, being no longer conſtrained, dilates, and vegetates like the tendrils of the vine. The extremities of theſe nervous ramifications are extremely minute, and regularly bound together after the manner of a powder puff: ſometimes their many nervous fibrillæ being uniformly united, form a contexture which much reſembles velvet.

Thus the nerves, being but little ſenſible in their large branches, and yet leſs in their trunks, become more ſo in proportion as they are diveſted of a greater number of their coverings; for the ſubſtance of the parts which compoſe the organs of ſmelling, is more delicate and more ſenſible than that of the parts which form the organs of taſte; the ſubſtance of the nervous parts which form the organ of ſight is more delicate, and more ſenſible than that of thoſe which compoſe the organ of ſmelling *. It is therefore evident, that the more ſubſtantial any nerve is, the more denſe is its ſubſtance, and the leſs ſenſible it will be.

But care muſt be taken here, that we do not confound the appearance with the reality.

The whole nervous ſubſtance is indeed ſenſible, but how many are the cauſes which may render that ſenſibility of no effect to the ſoul? It is only by means of the nervous fluid, that the ſoul is conſcious of the ſenſiblity of the nerves, or rather, it is only by the aid of this fluid, that it receives the impreſſion of external objects on the organs of ſenſe. Thus, that the ſoul may perceive the ſenſibility of the nerves, if I may be allowed ſo to expreſs myſelf, theſe organs muſt be compoſed of fibrillæ, which are replete with the nervous fluid, and the ſubſtance of theſe fibrillæ muſt be moved by the impreſſion of objects in ſuch a manner as to produce on the fluid they contain,

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* This is evident, if we judge of it only by the ſubtilty of their reſpective objects: that of the ſmell, is incomparably more delicate than that of the taſte, and that of the ſight is infinitely ſuperior to both.

contain, the motions neceſſary to communicate their ſenſations to the ſoul. Hence a defect in the fluid of the nerves in the nervous fibrillæ; when their reticular ſubſtance is too compact to admit this fluid, or too lax to retain it; when the coats of the organic fibres are too ſolid to yield to the impreſſion of objects, or too weak to re-act on their fluid; may be the cauſe, that an organical part ſhall ſeem to be entirely deprived of its ſenſibility. Hence the reaſon why the nervous film appears to be inſenſible; the capillaments which compoſe this reticular ſubſtance, being no longer real ducts, but cloſely compacted fibrillæ, have no communication with the ſoul. This is the reaſon why nervous fibres which are diſpoſed to oſſify, and thoſe which are obſtructed or covered, as it were, with a *ſtratum* of fibres entirely ſolid, appear to be void of all ſenſation.

If different cauſes may affect the ſenſibility of the nerves, as it reſpects the ſoul, ſo as to render it of no effect; different cauſes may likewiſe modify it. Let us ſtill wave any enquiry into the reality of this, and content ourſelves with things as they appear to our ſenſes; and without fatiguing ourſelves, by a fruitleſs endeavour to pry into the eſſence of our ſenſations as they are in themſelves, and as they reſpect our organs, let us confine ourſelves to conſider what they are with reſpect to the ſoul, and to determine their different degrees of energy from the ſtructure of the organs of ſenſe, and from the force of the impulſe communicated to their fluid.

The qualities of an organ, neceſſary to the higheſt degree of ſenſibility, may be reduced to two points, viz. its ſuſceptibility of being ſtrongly impreſſed by external objects, and that of forcibly communicating its impreſſions to the nervous fluid. The higheſt ſenſibility of an organ depends then on the extreme minuteneſs of its fibres, and on their very great elaſticity: for the thinner the coats of the nervous fibres are, ſo they be ſtrong enough to contain their fluid, the leſs they reſiſt the action of objects, and the ſtronger are the impreſſions they receive, *cæteris paribus*. This is the reaſon why nature is ſo attentive to diveſt the nerves of their exterior coats, when ever ſhe would form any delicate organ of ſenſation. Their ſenſibility is then increaſed in proportion to the minuteneſs of the nervous fibrillæ: and the more elaſtic they are, the better they will be adapted to communicate to the nervous fluid that impreſſion which is requiſite for tranſmitting to the ſoul the ſtrongeſt ſenſations.

This truth, which is founded on mechanical laws, is confirmed by experience. It is certain, that in ſlight inflammations, in ereſipelatous effloreſcences and arthritic ſwellings, the fibres are the moſt tenſe, and the moſt ſenſible. It is likewiſe certain, that the ſoft fleſhy parts of the body, polypous excreſſences, all fibres which are lax and greatly abounding with lymph, as the fibres of dropſical perſons, poſſeſs a very ſmall degree of ſenſibility, in compariſon of the parts which are tenſe and not exceſſively moiſtened. Another obſervation, which confirms the preceding, is that in the natural ſtate of our fibres, when we would receive any exquiſite ſenſation, we diſtend the organ, as may be obſerved in the eyes and ears of attentive perſons: the ſenſibility of our organs increaſing with the elaſticity of our fibres.

Let us conclude then, that *the higheſt degree of ſenſibility depends on the extreme minuteneſs and elaſticity of the nervous fibres.*

By this method we may judge how the ſenſibility of one perſon differs from the ſenſibility of another, notwithſtanding ſenſations are incommunicable.

BOOK II.

A
TREATISE
ON THE
HUMAN SOUL.

WE have hitherto conſidered Man as a phyſical being, let us now conſider him as a moral one. Let us turn our eyes inwards on ourſelves, contemplate the internal Man, and inveſtigate the nature of the ſoul: that we may do this in a manner becoming the dignity of the ſubject, let us reject the vain metaphyſical refinements of philoſophers, and wholly apply ourſelves to uſeful enquiries and important truths.

If the body be an admirable machine, the ſoul is a ſubſtance yet more wonderful. The body indeed exiſts independent of the ſoul, but it is the ſoul which animates it. This is that inviſible agent which actuates the limbs, which produces that harmony of motion, and all thoſe rapid and ſurpriſing movements we diſcover in the body. It is the ſoul which varies the phyſiognomy, and by turns impreſſes thereon grace, majeſty, fear, meekneſs, innocence, and love. It is this which renders the countenance the index of the mind, ſo that we read thereon the thoughts which the tongue refuſes to reveal. Without the ſoul, the body would be like a plant, ſeparated from the ſoil whence it drew its nouriſhment, and would periſh as ſoon as delivered from the womb, notwithſtanding its admirable ſtructure, from its inability, to ſelect the aliments, by which the decays of nature might be repaired. But however great this power of the ſoul may appear, it is not confined to this.

The body is undoubtedly a ſenſible being; but it is by the ſoul only that we are enabled to judge of the union of both, and are conſcious of that intimate communication, by which they are reciprocally ſenſible to the impreſſions of each other, and are indeed two diſtinct beings united in one.

It is the ſoul, which renders Man an intelligent and free being, by its innate energy, diſſipates the darkneſs in which nature had involved him, whereby he becomes acquainted with other beings, his fellow inhabitants of this earth, and ſoaring above into the celeſtial regions, makes him comprehend all nature in his ideas; and is, in fine, the cauſe of that amazing knowledge and ſagacity wherewith he is endowed.

It is the ſoul which aſſembles all the beings in nature before him, and, calling back paſt times, in ſome ſort extends his exiſtence throughout all ages; raiſes him above ſenſible objects; tranſports him into the vaſt fields of imagination; enlarges, ſo to ſpeak, the boundaries of the univerſe; creates new worlds, and enhances his enjoyments by the poſſeſſion of objects which never had a being.

In a word, the ſoul, by its knowledge and paſſions, enables this weak imperfect creature, Man, to change the face of nature; and, at his will and pleaſure, to become either its tyrant or benefactor.

But let us conſider theſe different objects ſeparately; and examine the faculties of the ſoul, in the ſame manner as we examined the mechaniſm of the body. Let us trace them in their unfolding, and afterwards through the exerciſe of their functions; ſtudy the nature of the paſſions; diſcover their origin; ſee in what they differ; in what manner they are produced; how nouriſhed; how they mutually aſſiſt each other; gather ſtrength; oppoſe and curb each other; and laſtly, in what manner they are combined. Theſe are the different points of view wherein I intend to conſider the ſoul: and although theſe ſubjects are, in appearance, dry and metaphyſical, yet this part of my work will probably prove more entertainment to the reader than the preceding.

Of the Faculties of the SOUL.

We have no immediate knowledge of the ſoul; all we know of it is by its faculties, and theſe are known to us only by their effects.

Man can perceive objects which are not cognizable by the ſenſes; he has therefore a *ſenſibility* diſtinct from that of the body.

He can compare his ſenſations, and determine their relations and difference; he has therefore a *faculty of judging*.

He retains the ſenſations and ideas which he receives; he is therefore endowed with *memory*.

He poſſeſſes freedom of choice, he therefore has a *will*.

Theſe faculties of the ſoul have been long known to philoſophers; and they are the only ones which modern philoſophy acknowledges. But if we attentively conſider human actions, there evidently appears in the ſoul another faculty, intirely different from the preceding, and is the ſame with that which in brute animals is called *inſtinct*: that is, a natural bias or proneneſs to particular objects, independent of, and prior to all knowledge.

It is this faculty which regulates the actions of Man in the early parts of life; and ſometimes regulates them in his riper years, though without being perceived; for it is not owing to learning, nor to experience that infants ſuck the breaſt, apply things to the mouth, or extend their hands to the objects which pleaſe them; it is not reaſon which teaches them to fly from danger, or ſhrink from fire, when they firſt feel it burn them.

This principle is inherent in Man, though not always perceived. As it was given us to regulate our actions till ſuch time as reaſon is ſufficiently unfolded, ſo we find, that in proportion as reaſon appears, inſtinct gradually vaniſhes: and in thoſe actions which it afterwards directs, as we ſeldom examine what paſſes within us, we are unable to diſtinguiſh ſuch as are to be attributed to reaſon, from thoſe which proceed from inſtinct.

A kind of titillation felt in the body generates love in the ſoul, but inſtinct points out the object. This is what cauſes the mutual propenſity of the ſexes, and prompts them to perpetuate their ſpecies. It is inſtinct which moves the mother to ſuckle her infant, teaches the hen to cover her eggs, and the wolf to nouriſh her young. But if Man ever had occaſion for this principle, if he ever ſtood in need of its conſtant aſſiſtance, it muſt have been in the firſt days of creation. Let us then view Man juſt as he came out of the hands of Nature; and here we are not to have recourſe to miracles, neither are we to imagine our firſt parents had any extraordinary means of ſubſiſtance; we are to ſuppoſe the laws of nature acting, in the *primordial* ſtate of things, as they act at preſent, ſeeing there is no reaſon to believe that they have varied; let us therefore endeavour to ſupply, by philoſophical inferences, the chronology of thoſe ages which are unknown.

Man, at his firſt coming into the world, is feeble, helpleſs, and entirely devoid of knowledge; he therefore needs ſtrength, aſſiſtance, and judgment: even his ſenſes are not then developed *; but ſuppoſing they were, he could make no uſe of them, not having as yet compared his ſenſations, much leſs diſtinguiſhed them; he perceives no external object; in a word, he is an almoſt inſenſible automaton, and a ſcarce animated ſtatue.

The ſenſes gradually unfold, and are perfected by exerciſe; by degrees an infant learns to ſee and feel; the faculties of the ſoul, afterwards expand with thoſe of the body, and riſe to perfection by exerciſe. What notion are we to form of Man's condition, during this long interval? In what manner are we to ſuppoſe

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* The eyes, indeed, diſcern the light, but indiſtinctly. The *membrana tympani* being relaxed, the ear cannot hear, and the nerves being yet in an inelaſtic ſtate, all the ſenſes are dull and imperfect.

him to ſubſiſt, ſince we muſt not have recourſe to celeſtial aid * ?

Suppoſing Man's condition, at the inſtant of his creation, in all reſpects like that of a new born infant, and that nature, in the unfolding of his organs, purſued the ſame laws as at preſent, he muſt evidently have died of hunger, long before he could even be capable of diſtinguiſhing his proper nouriſhment. The human race therefore muſt have periſhed, had Man's original condition been a ſtate of infancy: hence nature muſt have beſtowed on Man at firſt all we want at our birth, with whatever is requiſite for animal ſubſiſtance. The evidence of facts obliges us to believe, that Man came from the hands of the Creator, of full ſtature and ſtrength, with all the ſenſes in perfection, as Pallas is ſaid to have ſprung the head of Jupiter.

Thus, although it is to be ſuppoſed that Man muſt have been created of full vigour,

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* I have heard ſome philoſophers, more reſpectable for their piety than judgment, who ſuppoſed, our firſt parents had very ſtrange modes of ſubſiſting. Some pretended that they were fed by angels; others, that they were ſuckled by ſheep; and others again, that they were endowed with intuitive knowledge.

gour, with all his ſenſes perfect, we have yet advanced but very little: it remains to ſhew in what manner he was afterwards to ſubſiſt. It was not ſufficient to ſuppoſe him endowed with bodily ſtrength, that he knew how to avail himſelf of the information of his ſenſes, and of the activity of his limbs; he muſt likewiſe poſſeſs the faculty of diſtinguiſhing his aliments; for, without this, all the reſt of his endowments would have been uſeleſs. It may eaſily be conceived, in what manner Man, in proceſs of time, could be enabled to acquire this knowledge; and it is evident, that this was not the firſt knowledge he did acquire.

When hungry or thirſty, how came he to know that eating and drinking would ſatisfy theſe cravings? Let thoſe who pretend to deduce every thing from reaſon and experience, ſolve this problem. Confine Man's faculties to ſimple reaſon, and leave him to be inſtructed by ſlow experience, his whole life will be ſpent before he can attain the knowledge of his aliments; ſo that he might die of hunger at the foot of a tree loaden with fruit, of thirſt on the bank of a river; or, from his ignorance of the nature of comedible ſubſtances, eat poiſon. What then muſt have become of Man, had he been without inſtinct, his only infallible guide. Who does not ſee that, with this boaſted reaſon, the human race had periſhed, notwithſtanding all the precautions of nature for their preſervation.

Some think to elude the neceſſity of inſtinct to Man, by alledging, that he imitated the beaſts; but this is only ſhunning the difficulty, not ſolving it.

Taking it for granted that Man imitated the beaſts, it is evident, that this propenſity to imitation, muſt have been innate and prior to all knowledge: but how came Man by this propenſity to imitate them? Beſides, doth not this imitation ſuppoſe in Man a knowledge he could not have as yet acquired; a knowledge of the phyſical relation, between his nature and that of beaſts? How many difficulties ſtand in the way of this hypotheſis! And what a concurrence of circumſtances muſt be imagined! We muſt firſt prove, that Man was endowed with capacity to obſerve the brute animals; and then ſhew how he came to confine his imitation of them to certain particular caſes; as for inſtance, why he imitated the goat, only when it brouſed on the tendrils of the vine, and not when it cropped the hemlock; for otherwiſe he would have found a poiſon where he ſought for food.

Hence it is evident, that by attributing to Man an inſtinct, whereby he ſupported himſelf in imitation of the inſtinct of brute animals, and admitting him to have imitated them in thoſe caſes only which are conformable to his nature, we attribute to him a guide different from reaſon. It were more eligible to allow him an inſtinct, by which he is enabled of himſelf to diſcern his proper nouriſhment; inſtead of allowing him any faculty which is ſtill reſolvable into inſtinct, though of another kind, and ſerves only to multiply difficulties unavoidable on ſuch a ſuppoſition.

Reaſon then could not be a ſufficient guide to Man; we muſt therefore allow him to poſſeſs an inſtinct, as an additional mental faculty whereby he is directed, like other animals, in the choice of his proper aliments.

Of INNATE SENTIMENTS.

Beſides theſe faculties, there is in the ſoul an innate ſentiment, *prior to all ſenſation*, and to all ideas with which nature has connected the preſervation of human beings; I mean ſelf-love, that powerful principle, which irreſiſtibly directs mankind in all their actions, often without being perceived, the ſource of every paſſion, and the end to which all our deſires are directed.

As this love is unbounded, and infinitely more ſtrong than the love of others, ſimple as it is, it has been divided into two ſentiments, different in their nature and effects, viz. love of ourſelves, and love of preference: but it is eaſily perceived, that theſe are but one and the ſame affection of the ſoul, which is only diſtinguiſhable by circumſtances.

When the love of ourſelves acts ſimply in Man, without his comparing himſelf with others, it is a ſentiment prompting him to ſeek after happineſs or pleaſure, and to fly from pain.

When it acts in oppoſition to the advantage of others, it induces Man to prefer himſelf to every other conſideration, and to purſue his own good, even to the prejudice of his friend. In the firſt caſe, the love of ſelf, prompting us inceſſantly to purſue happineſs, becomes the ſource of a vaſt number of pleaſing ſentiments, with regard to the objects of our pleaſure. In the ſecond, the love of ſelf annihilates every other ſentiment, and changes its nature. It is this which turns fraternal affection into hatred, arms rival brothers for their reciprocal deſtruction, and inſtigates them to mutual murders on the ruins of a father's throne. It is this which, among ſavage nations, inſtils fury into the breaſt of warriors, ſteels the victor's boſom againſt his vanquiſhed foe, ſo as even to make him devour the entrails of the ſlain yet palpitating with life. It is this which, in a city beſet by an enemy without, and preſſed by famine within, transforms the tender nature of females to ſavage fury, and makes the mother deſtroy the fruit of her womb. It is this, in a word, which inſpires all thoſe cruel deeds, all thoſe ſanguinary actions, which nature recoils to hear mentioned.

Another ſentiment innate in the human heart, and which is felt only at intervals, is maternal affection, that indearing propenſity, on which the preſervation of our ſpecies during infancy depends.

This ſentiment is independent of every other, and is as blind and undiſcerning in its manner of acting as inſtinct itſelf *. A modern author has attempted to deduce it from ſelf-love. " The mother, ſays " he, at firſt nouriſhes her little ones for " her own, afterwards for their good." But how did the firſt mother know, that the ſuckling her child would be of ſervice to herſelf? Beſides, in how many other inſtances doth this affection appear? Conſtraint, diſagreeable offices, every kind of ſelf-denial, become pleaſing taſks to a mother, and troubleſome though they be, yet ſhe conſtantly diſcharges them at the expence of her pleaſure, reſt, and often of life itſelf: — how many dangers do ſome mothers voluntarily undergo for the preſervation of their offspring!

It is no leſs abſurd, to deduce this affection from friendſhip. On what ideas of the merit of a new born infant, incapable of communicating any pleaſure, and

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* We frequently obſerve hens to hatch and feed young ducklings, and ducks to hatch and feed chickens.

ſcarce one remove from ſtupidity, can it be founded?

Hence it is evident, that the love of mothers for their offspring is a ſentiment impreſſed on the human heart by the Creator.

A Refutation of the Opinion of Philoſophers concerning PITY.

Some philoſophers to the number of innate ſentiments already mentioned add pity—that gentle emotion which moderates the love of ſelf; intereſts the happy in the ſufferings of their fellow creatures, and by the bond of philanthropy unites all human kind.

"We ſympathize with the unhappy, "we weep at the plaintive ſorrow of the "unfortunate, and are moved with the "cries of thoſe who are in pain."

"At the ſight of a ravenous beaſt, "tearing the tender body of an infant, we "feel extreme anguiſh, and the ſoul un"dergoes excruciating agitations."

"Pity is ſo natural a ſentiment, that it "precedes reflection, and even brute ani"mals have evident marks of it."

"A

" A horſe ſtarts back at the ſight of a
" dead one, one dog licks the wounds of
" another, and cattle, when driven to the
" ſlaughter-houſe, vent doleful cries."

Theſe are the proofs whereon thoſe philoſophers ground their opinion.

At firſt ſight it appears to be well founded, but it is eaſy to conceive, that nature formed not Man originally compaſſionate. All men have not pity, ſavages but little, children leſs, and Man, who, if this opinion were true, ought to give the moſt evident proofs of it, in the early part of life, betrays not the leaſt ſign of any ſuch ſentiment.

If pity is an innate ſentiment, why the human heart is void of it in infancy? Why, in thoſe who are inſane from their birth, ſhould this principle be likewiſe wholly imperceptible, ſeeing they are not deprived of the other faculties of the ſoul?

" Pity is a ſentiment ſo natural, that
" the brute creation have many works of
" it."

What foundation is there for this aſſertion?

" A horſe ſtarts back at the ſight of a
" dead one; one dog licks the wounds of
" another; and cattle, when driven to the
" place of ſlaughter, vent doleful cries."

But who is aſſured that this is not an inſtinct peculiar to brutes? Who knows, whether theſe external ſigns be not the effect of ſome diſagreeable ſenſation, or rather, of fear excited by the horror of the ſight, than marks of compaſſion.

Even in Man, the external marks of pity are not pity itſelf; we may have the ſtrongeſt appearance of being affected, and not feel the leaſt emotion. A perſon may zealouſly aſſiſt in dreſſing another's wounds, eaſing his aching limbs, and alleviating his misfortunes, merely from the hope of being relieved in his turn; another, from a motive of being upon good terms with heaven; and a third, wholly from the pleaſure attendant on the exerciſe of virtue.

He alone who, on ſeeing the ſufferings of the unfortunate, compaſſionates their lot, is a compaſſionate man. Now with a little reflection we may perceive, that pity is an artificial ſentiment, acquired in ſociety; it is founded on the idea of pain, and the relations in which Man ſtands with reſpect to ſenſible beings. For, to pity the miſeries of others, he muſt firſt have an idea of them; he that has never ſuffered,

fered, nor has any idea of pain, is unmoved at the tears, complaints, the long and vehement cries of the ſorrowful heart; the ſight of the ſufferings of others does not affect him; their wounds appear diſguſtful; he ſhuns the ſight of them, and keeps aloof, but never commiſerates them.

"To pity, we muſt be acquainted with "the ſufferings of our fellow-creatures, "but not feel them. When we know "by experience what pain is, we "pity thoſe who ſuffer; but when we "ourſelves are in pain, we then feel only "what we ourſelves undergo. In every "ſtation ſubject to the calamities of life, "we allow to others that ſhare of our ſen- "ſibility only which we have no occaſion "for ourſelves." Pity is therefore evidently no more than our own ſenſibility, directed by an act of the mind towards thoſe with whom we ſympathize. Thus pity and ſelf-love are always in an inverſe proportion.

They who, from an exceſs of delicacy, and a continual habit of indulging themſelves in every ſort of pleaſure, are not affected by the ſufferings of others; their ſenſibility is conſtantly employed on themſelves; they are altogether unconcerned about all beings beſides, and their hearts are ſteeled againſt the ſufferings of mankind. In proportion as this love of ſelf increaſes, pity decays, and frequently becomes extinct.

He who now melts into tears at the diſtreſſes of the unfortunate, was he his enemy, inſtead of alleviating, would aggravate his misfortunes.

Nero, who wiſhed he had never learned to write when preſſed to ſign the warrant for a criminal's execution, could delight in the murder of his enemies. The tyrant *, that loudly bewailed the fate of *Hecuba* and *Andromache*, as repreſented on the ſtage, could hear without emotion the cries of thoſe he had doomed to deſtruction.

Pity is not only deſtroyed by the paſſions; it is even generated in the heart only by prudent reflections, is nouriſhed only by tender ſentiments, and is extinguiſhed by the frequency of thoſe objects, which ought naturally to confirm it. Let us ſuppoſe a man has never heard any one diſcourſe on ideas of juſtice, goodneſs, clemency and generoſity: he muſt remain for ever ignorant of the very names of thoſe virtues. By a frequent attendance at thoſe bloody feaſts, which, in ſome great cities, are given by avarice to idleneſs, you will ſoon loſe all ſenſe of the ſtrong emotions you had hitherto felt at the cries of mangled animals; in time you will hear them with pleaſure, and wait impatiently for a repetition of them. By often frequenting them, the ſoul becomes callous to their impreſſions; is unaffected with the proſpect of human miſeries, and inſenſible to every tender emotion.

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* Alexander, tyrant of Phares.

Does not theſe reaſons prove, that pity is not a native of the human breaſt?

The different powers of the ſoul, may therefore be reduced to theſe following, viz. ſenſibility, inſtinct, underſtanding, memory, will, ſelf-love, and maternal affection.

When we conſider the mutual connexion and dependence of theſe different powers, we readily perceive, that every production of genius, the effects of the paſſions, and all the other wonderful phenomena of the mind, are produced by their combination.

What an admirable harmony! where ſo ſmall a number of ſimple cauſes are united in ſo incomprehenſible a manner, as to produce ſo many and ſo extraordinary effects.

The different faculties * and various ſentiments immediately received by the ſoul from nature being diſcovered, I now proceed to examine theſe faculties, ſee how they operate, and in what proportions they are combined.

Of SENSIBILITY.

The nature of the ſenſibility of the ſoul is no better known than that of the body; all our knowledge of it is, that ſenſibility, whether of the ſoul or of the body, is a paſſive faculty, requiring the impreſſion of external objects to ſet it in action.

The different impreſſions ſenſibility receives, may be ranged, in reſpect to their objects, into two claſſes, viz. *ſenſations* and *ſentiments*.

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* We ought not to confound the terms *power* and *faculty*. Sentiment, paſſion, ſenſibility, memory, underſtanding, inſtinct, will, are all powers of the ſoul; but the powers of the mind only are properly termed *faculties*.

The former ariſe from material objects, the latter from moral ones.

Of INSTINCT.

Inſtinct, that occult faculty, which is neither derived from principle nor prior knowledge, the mode of whoſe operations is ſo ſingular, and which is, moreover, intirely accompliſhed by nature, intereſts us but very little. The notice I ſhall take of it as I proceed, will be therefore very inconſiderable.

Of the UNDERSTANDING.

All our knowledge of the underſtanding is derived from that of its operations only; we are ignorant of its eſſence, as we are of that of thought. But how wonderful is this faculty! How ſurprizing its operations! As an active principle, it perceives objects, compares, unites, and diſjoins them in a thouſand ways, judges of their relations: by theſe different combinations it acquires the knowledge of things, unravels the ſyſtem of the univerſe, tranſports us into futurity, recalls paſt ages, collects into one point all the pleaſures of life, extends our exiſtence beyond the grave, and triumphs over death itſelf.

The underſtanding, though active by nature, has undoubtedly need of the ſenſations to enable it to act, but operates of itſelf when it has received this aſſiſtance: it is the will which ſelects the objects of its operations; but it is the underſtanding alone which perceives them, determines on their relations, and forms its judgment without our interpoſition.

There are two diſtinct powers in the underſtanding, which philoſophers have ever confounded *, viz. the power of perceiving, conſidering, and comparing objects; and the power of judging of their relations. One of theſe is the baſis of the other, and neceſſarily precedes it: by the firſt, we compare the different ſenſations in their ſeveral appearances; by the ſecond, we judge of their relations, and thence form our ideas.

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* The underſtanding operates with ſo great activity in certain caſes, and the judgments follow ſo extremely cloſe in others, that they are eaſily confounded.

We divide the underſtanding with reſpect to its modes of judging, into reaſon and imagination: theſe are ſimple modifications of the ſame power, which philoſophers have taken, from I know not what cauſe, for two different faculties of the ſoul.

When the underſtanding is employed in comparing ſenſations, which are either immediately received, or tranſmitted from the memory, and when it judges of their real relations, it is called *reaſon*. When the ſame faculty is exerciſed on the ſame objects differently combined, and when it forms ſuch an aſſemblage as has no model in nature, it is called *imagination*.

It was reaſon which ſuggeſted thoſe ſtriking characters of men we find in *Shakeſpeare*. It was imagination which collected whatever is beautiful in nature on one hand, and whatever is horrible on the other, to form thoſe admirable deſcriptions of Elyſium and Tartarus in *Virgil*.

How different ſoever reaſon and imagination may appear, they are certainly one and the ſame faculty, diſtinguiſhed by the different mode of exertion only. If we conſider them but for a moment as different faculties, we may juſtly reproach thoſe who have hitherto treated upon this ſubject, with having improperly diſtinguiſhed them, and with not having rightly defined their extent.

Even *Helvetius*, who has more minutely handled this ſubject, has too much confined the power of the imagination, by defining it the power of conceiving things in a figurative manner, and of rendering ideas by images. If it is the imagination which gives being to a ſphynx, creates the gardens of Heſperides, or the inchanted Iſle of Armida: it is ſtill the ſame faculty which, with the help of atoms, lines, ſurfaces, and ſolids, builds the worlds of *Epicurus* and *Des Cartes*. It is the imagination which collects the different events of human life in romance, combines them, forms intrigues, like thoſe which the paſſions are capable of producing, and gives them the air of true hiſtory, though they are only the work of genius and ſenſibility. It is imagination that launches into futurity, prevents the rapid flight of time, tranſports us beyond the grave, reſtores ſenſibility to our aſhes, and eludes the power of death.

The peculiar characteriſtic of the imagination is invention; I have ſaid, that its productions are not formed upon any model in nature; ſuch a model may indeed exiſt, but muſt not be known, otherwiſe it is no longer invention, and all is reduced to mere narration: the picture then becomes a copy; the romance, a hiſtory; and imagination, reaſon.

Of the FORMATION *of our* IDEAS.

We diſtinguiſh objects by their reſpective ſenſations. On comparing theſe different objects, we find in them ſome common properties, and ſome that are peculiar to each object. The knowledge of the properties and relations common to different individuals, are called *ideas*.

Of this ſort are the ideas of extenſion, impenetrability, gravity; properties common to all matter; as alſo that of a triangle, taken from the meeting of three right lines at their extremities.

The more conſiderable the number of ſingle objects, whoſe properties are common is, the more extenſive is the idea: the idea of body, for inſtance, is much more extenſive than the idea of metal.

Although every idea is a particular one, yet there is no ſimple idea of any ſingle object, much leſs of ſpecies or kind; becauſe every idea is compoſed of thoſe properties which objects, when compared, have in common: now every individual object, every ſpecies, and every kind, beſides thoſe common properties, have ſeveral which are peculiar. What metaphyſicians have given for ſimple ideas, and even Locke himſelf, is only a compound of abſtract ideas. We may eaſily be aſſured of this, by analyſing their definitions; how great ſo ever the number of ideas which enter into the maſs may be, you will oftentimes find that number too ſmall, to define the object whoſe idea they are intended to convey; as in the ideas of Man, animal, virtue, plant, &c.

Hence ariſe thoſe eternal diſputes, to which almoſt every metaphyſical enquiry is liable, and to which they have ſo frequently given riſe. Hence the many abſurd concluſions which flow from the ſyſtems of philoſophers; examine their definitions, and you will find the idea of a virtuous man, according to *Socrates*, very different from that of a virtuous man, according to *Diogenes*; and the idea of Man in *Ariſtotle*, is by no means the ſame with the idea of Man in *Plato*. What ſeems to have led metaphyſicians into this error was, that, as the ſeveral properties of bodies appear always combined in the ſame ſubject and always the ſame, they inferred, that they muſt all appertain to the ſame ſubject, and when they affixed a name to that ſubject, they conſidered the aſſemblage of theſe qualities, not as a compound idea, as it really is, but as a ſimple uncompounded idea.

Although every idea may be equally abſtract, all are not of the ſame nature. Some, which are formed from the relations of corporeal beings compared together, have only material properties for their objects; ſuch are the ideas of extenſion, burning, hardneſs, motion, &c.

Others, which are formed from the relations of ſenſitive, active, and intelligent beings, compared together, have only intellectual properties for their objects; of this ſort are the ideas of goodneſs, juſtice, beauty, &c.

The former are denominated *phyſical*, the latter *moral ideas*; by the firſt we acquire the knowledge of the material creation; by the latter, we are tranſported to the intellectual world, and acquire the knowledge of ſpirits *.

Of MEMORY.

How many different words! How many adventures! How many volumes are contained in Man's memory! How many languages! What a field of hiſtory and chronology! But what is the nature of memory, this vaſt receptacle of ſo many ſenſations, and ſo many ideas; where ſo many acquirements are depoſited, where events, ſwallowed up by time and never to return, are preſerved from the eternal night of oblivion; where times which are no more, enjoy a kind of perpetuity? A new prodigy this! as admirable as the underſtanding itſelf, and concerning whoſe nature and origin we are equally in the dark.

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* The face of nature varies with our different modes of thinking; to the ignorant and atheiſt, all is inanimate matter, and the univerſe conſiſts of none but corporeal beings: how different is its appearance to the learned and religious! To theſe the entire world aſſumes a new aſpect; they perceive every where the beneficent hand of Providence; they diſcover the Creator's goodneſs in every production of the earth; their table is ſpread with the inſtances of his bounty; they repoſe ſecure under his protection, are inſtructed by his chaſtiſements, and enjoy every pleaſure as the gift of his hands; they diſcover all around them, the goodneſs of the author of being, and, to them, all nature teems with life.

Memory is grounded on the ſenſations and ideas, but is entirely different both from ſenſibility and from the intellect. Without ſenſibility, there can be no ſenſations; without the intellect, there can be no ideas: but when the ſenſations are once received, and the ideas formed, the ſoul no longer requires the aid of theſe faculties to retain them. Hence memory is a particular faculty; and is the power of preſerving the impreſſions and ideas of objects which have affected us; in a word, it is the mirror * of paſt ſenſations, ideas, and ſentiments, as ſenſibility is the mirror

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* Some ſuperficial philoſophers, always ready to explain what they do not underſtand, having obſerved, that the memory much depends on the organization, have concluded that this faculty is wholly mechanical. "Some accidents,

ror of ſenſations and ſentiments which are preſent to us.

Of

" accidents, ſay they, which happen to the body only, " weaken and deſtroy the memory; it therefore re" ſides in the organs of the body." But how is it poſſible in ſo intimate an union, as that of the ſoul and body, for an accident to affect the one without affecting the other at the ſame time? How is it poſſible to conceive this accident as acting ſeparately on the one only? Beſides, the ſame cauſes which deſtroy the memory, likewiſe deſtroy reaſon; are we therefore to conclude, that the judgment is an organic faculty? That phyſical cauſes oppreſs, or prevent the exerciſe of our faculties in whole or in part, is the true conſequence to be deduced from theſe obſervations. What then can be more abſurd, than to ſuppoſe the memory a corporeal faculty?

They who maintain this abſurdity, bring many arguments equally abſurd to ſupport it. They ſay, " The " ſenſations are vibrations of the nervous fibres produced " by external objects, and the memory is the receptacle " of all theſe vibrations." But in what manner could they explain, by the help of this, the wonderful phenomena of the memory? Were it true, that the ſenſations are produced by the vibrations of the organ affected; it is falſe, that they are communicated to the ſoul in the ſame manner: but ſuppoſe this to be true likewiſe, what will they gain by this?

The remembrance of ſenſation is continued for a long time; the vibrations which cauſe them, according to this hypotheſis, laſt only a few moments, even in the moſt elaſtic chord; how then is it poſſible to conceive

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Of REMEMBRANCE *and* RECOLLECTION.

Philoſophers have fallen into as groſs errors with regard to the memory, as they have with regard to the underſtanding.

Locke,

that they ſhould endure for a long ſeries of years in the fibres of our organs, not near ſo elaſtic, and alſo in the fibres of the brain, which are incomparably leſs ſo? Thus, by ſuppoſing the ſenſations to be produced by the different vibrations, when the fibres ceaſe their tremor, the vibrations inſtantly ceaſe; what ſenſations then can remain in the memory, beſides thoſe with which the organs are actually affected? Our philoſophers, when called upon to explain how this long duration of ſenſations is to be accounted for according to their ſyſtem, gravely anſwer: "Theſe vibrations of "the nervous fibres in the brain produce a kind of durable impreſſion, whereby the ſenſations and ideas are "fixed in ſuch manner, that an intellectual Being, perfectly acquainted with the organization of the brain, "and capable of diſtinguiſhing, in a very accurate manner, every impreſſion in it, might read their characters "as in a book; that this prodigious number of extremely minute organs, appropriated to ſentiment "and to thought, would be to ſuch a Being what "printers types are to us." What a pretty conceit this of impreſſions on the brain! Where did theſe ſages ſee the impreſſion? On what foundation do they build ſo ſtrange an hypotheſis? They tell us, it is by an impreſſion theſe ſenſations are preſerved; but what they take no notice of, although it is of the utmoſt conſequence

Locke, the firſt rational metaphyſician, he who reſcued the ſcience from that chaos of obſcurity, in which it was involved by

ſequence to be explained, is in what manner theſe ſimple vibrations are thus impreſſed. But why talk of vibrations? It is the nervous fluid which carries the impreſſions to the ſoul. Suppoſing this fluid could thus imprint characters on the brain, how can it produce a durable impreſſion on ſo ſoft a ſubſtance?

But to ſay no more about all theſe abſurdities, there will ſtill remain, in their ſyſtem, a number more than ſufficient to demonſtrate them to be groſsly miſtaken. By theſe vibrations and impreſſions they believe the retention of our ſenſations accounted for: but how do they account for that of the ideas? There is certainly no vibration, nor any fibre; how then is this impreſſion produced? Beſides, by making the memory a purely organic faculty, the objects of which are the impreſſions and characters engraved on the brain, we can never conceive the reproduction of the ſenſations of the mind, as independent of the reiterated action of theſe objects on the ſenſes, that is to ſay, without the preſence of the objects which produced them.

It frequently happens from diſeaſes, that we forget almoſt every thing, and that recollection returns afterwards by ſlow degrees. If then the characters and impreſſions which preſerve the image of objects in the ſoul be of this nature, when they are once defaced, there is an end of all the ſenſations depoſited in the memory, and this faculty can no longer exiſt.

Let us conclude, that the memory is a faculty purely ſpiritual, like the judgment and will, the ſchools, has defined memory, "the "power to revive again in our minds "thoſe ideas which, after imprinting, "have diſappeared, or have been laid aſide out of ſight." They who ſucceeded him, have given the ſame definition. Some moderns, who obſerved the poſſibility of remembering an idea without the power of recollecting it, have with reaſon ſuppoſed that Locke is miſtaken. They diſtinguiſhed in the ſoul memory*, remembrance, recollection, and made them ſo many particular faculties, in which they are miſtaken in their turn. For if we carefully conſider the mutual connexion of our faculties, we eaſily perceive, that remembrance and recollection are only effects of our different intellectual powers, reciprocally combined.

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* They who account memory a corporeal faculty, make remembrance and recollection purely phyſical faculties. The ſoul retains a conſciouſneſs of what it has perceived before, it is likewiſe conſcious of the novelty of any ſenſation. Theſe philoſophers ſuppoſe it to be owing to ſome change in the affected organ, or by ſome difference in a particular impreſſion, that the ſoul diſtinguiſhes a repeated, from a new ſenſation. But what change can the action of objects, but once repeated, occaſion in the organ which receives it? Beſides by attributing, as theſe philoſophers have done, a ſenſe of novelty to the *virgin ſtate of the fibres*, what other means will the ſoul have, of knowing whether or not it has experienced that ſenſation, than comparing it with others which are laid up in the memory.

When the ſoul is affected with ſenſations and ideas; the retention of theſe ſenſations and ideas I call *memory.*

We frequently experience the ſame ſenſations and ideas, which we have experienced before; the reproduction of theſe ſenſations and ideas, with a ſenſe of their identity, is what I call *remembrance.*

We can aſſemble at pleaſure a ſeries of paſt ideas and ſenſations; this faculty I ſhall term *recollection.*

Memory is a faculty purely paſſive like ſenſibility; but the remembering of particular ſenſations or particular ideas, is not ſimply the perceiving our ſenſations preſent and paſt, but the knowing the ſenſation or idea, which we actually experience, to be the ſame we experienced before.

The memory is the power of retaining paſt impreſſions. Senſibility that of perceiving thoſe which are preſent to us: one is the ſtorehouſe of things paſt; the other, of things preſent: but it is in the underſtanding alone that the power reſides, of perceiving in theſe ſtorehouſes, things paſt and preſent, of conſidering and comparing them, and determining, whether their impreſſions are altogether new, or only reproduced; in a word, the underſtanding alone is conſcious of their identity. Hence we perceive that remembrance is not a ſimple faculty, but is compounded of memory, ſenſibility and underſtanding.

In recollection likewiſe, it is not the memory that retraces paſt ſenſations and paſt ideas in our minds: if we attend ever ſo little to what is paſſing within us during the ſucceſſion of our thoughts, we may be convinced, that it is the underſtanding alone, as being continually actuated with ſome ſenſation, or idea, which paſſes from thoſe with which it is actually affected, to analogous ſenſations, and to ideas which have formerly affected it, and which thus recalls paſt things to the mind by means of analogy. Thus, when we chuſe to recollect any ſenſations or ideas, we perceive them ready to preſent themſelves, as ſoon as the mind runs over the neareſt analogies.

If this power of rendering preſent to the mind, the ſenſations and ideas treaſured up in the memory, ſometimes act without our interpoſition, it is alſo ſometimes ſubject to the will. Recollection is not therefore a ſimple faculty, but the aggregate of many faculties united. In remembrance, memory is combined with the underſtanding, and preſent ſenſations; in recollection it is combined with the underſtanding and the will, but without theſe ſenſations. It is thus that theſe different faculties jointly produce remembrance and recollection.

Of the WILL.

It remains, that we enquire into the nature of the will; a ſingular faculty, which is ſometimes directed by the underſtanding, but is always governed by ſentiment; has a ſtrong propenſity to pleaſure, and abhorrence of pain; and, from that mixture of good and evil, which the underſtanding preſents to it, chooſes the one, rejects the other, and with an abſolute authority determines

Man towards action or reſt. We are acquainted with the nature of the will only by our conſciouſneſs of its exiſtence and effects; notwithſtanding all our efforts to dive farther into its nature, and let our ſagacity be ever ſo great, our endeavour, will ſerve only to involve us in darkneſs and confuſion.

The will, conſidered in its effects, is a faculty ſometimes active, and ſometimes paſſive. Active, when it impels man to action; paſſive, when ſwayed by ſenſation.

The will is always ſubordinate to ſenſation; for man is by nature continually under the influence of ſenſibility, and can no more reſiſt its dictates, than he can will his own hurt, or oppoſe his happineſs.

Origin of the different Sentiments of the SOUL.

The love of happineſs is innate in every heart, like the love of ourſelves from which it is derived.

Every man loves himſelf; but nature, by creating him ſubject to wants, has not permitted him to love himſelf alone. The whole of his ſenſibility therefore cannot be centered within himſelf; there

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are things in nature, to which he is connected by the heart and affections. Man cannot, like the ſupreme Being, be happy in the contemplation of himſelf, and without the aſſiſtance of others. The inexpreſſible anguiſh we ſuffer from the loſs of a friend that was dear to us, flows only from a vacuity in the heart; reaſon diſcovers the void, and till ſome new object offers to poſſeſs it, our grief continues.

Senſible beings can only be affected by pleaſure and pain. The ſoul therefore receives only two kinds of ſenſations, the pleaſing and the painful: theſe two ſenſations are differently modified, but they are always diſtinguiſhed by two general characters only. There are no indifferent ſenſations: thoſe which are ſo called are but the loweſt degrees of pleaſing or painful ſenſations, too weak to influence the ſoul, and determine its action. But as Man is a compound of two ſenſible ſubſtances, and as each of theſe ſubſtances has its particular object, there are two kinds of the pleaſing ſenſations, and two kinds of the painful, viz. the ſenſations of the body, and the ſenſations of the ſoul.

The impreſſions of objects on the ſenſes are tranſmitted to the ſoul, and there the ſenſations unite: hence the ſoul partakes of the pleaſures and pains of the body; the ſoul likewiſe has ſenſations which are peculiar to itſelf.

Thus all the good we enjoy, and all the evil we ſuffer, proceed from two different ſources, viz. moral and phyſical objects. Man therefore receives impreſſions of pleaſure both from objects which act on the body, and on thoſe which are purely intellectual: the latter are called the pleaſures of the mind, and the former, bodily pleaſures. The ſame diviſion will alſo apply to painful ſenſations: and from theſe, according to the predominancy of either, proceed all the happineſs and miſery of human life.

We muſt be careful to diſtinguiſh ſenſation from ſentiment. *Senſation* is a pleaſing or painful affection of the ſoul, produced by the impreſſion of objects on the ſenſes. *Sentiment* is a ſtrong affection of the ſoul, produced by the relation which the underſtanding perceives between us and phyſical or moral objects.

Every object that affects us, if its ſenſation be pleaſing, inſtantly creates in the ſoul the ſentiment of *love*; or, if its ſenſation be the reverſe, the ſentiment of *hatred*: for it is a conſequence of the love of ourſelves, that we love what is profitable to us, and hate what is prejudicial to us.

From theſe ſentiments of love and hatred, combined with our different ſituations in reſpect of the objects of our ſenſations, proceed many other ſentiments. When we are agreeably affected by any object, which it is in our power to enjoy at will, a ſudden pleaſing calm creeps on our ſenſes, our wiſhes ſeem ſatisfied, the ſoul ſinks into joy, and is inſenſible to every other ſentiment. But if this object be not within our reach, the privation of it excites in the ſoul deſire, attended with a painful emotion. On the contrary, if the ſenſation be diſagreeable, and we cannot avoid the impreſſion of the object which cauſes it, we experience neither joy nor deſire; and ſentiments of *grief* and *averſion* ariſe in the ſoul.

From our different ſituations with regard to different objects, ariſe two other emotions, hope and fear; *hope*, is that ſoothing and delightful ſentiment which enables us to ſupport the load of life, when under the oppreſſion of misfortunes; *fear*, on the contrary, is a painful ſentiment, which has been often known to ſhorten the duration of Man's exiſtence.

Hope and fear are affections of the ſoul analogous to joy and ſadneſs, and, as it were, ſhades of theſe affections. Joy and ſadneſs are extremely active ſentiments: one ſprings from the pleaſure of enjoyment; the other from the pain of ſuffering.

Hope and fear are moderate ſentiments, proceeding from ſadneſs and joy. The firſt ſprings from the probable view of happineſs; the other from the probable view of miſery: their force is ever proportionate to the degrees of the reſpective probability, ſo that when theſe degrees are ſo multiplied as to approach very near towards certainty, the difference of the ſhades becomes imperceptible: thus hope inſenſibly becomes joy; and fear, ſadneſs.

Accordingly joy and hope are the chearful attendants on pleaſure: ſadneſs and fear, the gloomy attendants on pain.

This is the origin of our deſires and paſſions, which on examination appear to be the effect of ſentiments inſpired by nature, combined with the underſtanding and the will. It is not however the ſame with that which has been aſſigned by a modern philoſopher *, celebrated for his extenſive knowledge, elegant ſtile, and love of ſyſtem. As the authority of this writer is of great weight, and as it might be prejudicial to truth were his opinion to prevail, I will offer ſuch reaſons as will probably determine the reader to reject it.

Buffon pretends, that our appetites and paſſions are wholly phyſical; becauſe they naturally

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* The ſituation of an author is extremely unfavourable, who writes upon any ſubject, after one of theſe ſyſtematical writers, and accompanies all he advances with proofs. As the gardener muſt firſt pull up the weeds which over-run the ground, before he attempts to ſow or plant it; he muſt not only eſtabliſh his own opinion upon evident proofs, but likewiſe deſtroy the oppoſite one. This neceſſity is a clog on his genius, interrupts the order of the ſubject, and makes his work appear languid. Contrary to the practice of thoſe who run after objections, that they may have the pleaſure to ſolve them, I could have wiſhed I might have entirely neglected them, but find I cannot avoid diſcuſſing ſuch as naturally riſe out of my ſubject.

naturally ariſe from our ſenſations *. To demonſtrate the falſity of this argument, we need only diſtinguiſh in our ſentiments, that part which proceeds from phyſical, from that which proceeds from moral cauſes; let us analyſe them again, ſetting apart that which belongs to the ſenſes; the remaining part will neceſſarily belong to the ſoul.

I have ſhewn, that whenever any object affects us, there ariſes in the ſoul a ſentiment of love or hatred for it; the cauſe of this has been already pointed out. Although theſe ſentiments are neceſſarily produced by means of the ſenſations; although the ſoul cannot poſſibly receive any others; and although their relations are always the ſame with regard to the nature and force of theſe ſenſations, they are not however their neceſſary, nor their only effect: for it does not follow, that becauſe the ſenſation is produced, the ſentiment muſt likewiſe of neceſſity be produced;

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* As Man is a being compounded of two ſubſtances, it is a perpetual ſophiſm among philoſophers, who have imperfectly obſerved the reciprocal influence of theſe two ſubſtances, to attribute to the one what ought to be attributed to the other; whereas had they thoroughly examined them, their enquiries would have guided them to the truth, and they would not have fallen into this miſtake.

ced; there muſt alſo exiſt in the ſoul, a propenſity or averſion to the object. This propenſity and this averſion are the effect of the love of ourſelves combined with the underſtanding, which alone judges of the relations ſubſiſting between the impreſſions of theſe objects and our happineſs. But what affords us a convincing proof of this is, that, if the object be corporeal, when the impreſſion produced on the organ has been communicated to the ſoul, the organ has entirely performed its office, and has no longer any influence; it has yet leſs when the object is of a moral nature; for in ſuch a caſe the ſenſes have nothing to do in it. Therefore the ſentiments of love or hatred are only acts of the ſoul, which perceives the relation of objects to our well-being, and has a conſequent propenſity or averſion thereto. So that the paſſions of love and hate have in them ſomething of an higher nature, and are not purely phyſical.

But to continue our analyſis.

Deſire has always a ſentiment of love for its baſis, as averſion has a ſentiment of hatred: and ſince every ſentiment has an object, the ſenſations are therefore abſolutely neceſſary to give birth to deſire and averſion, but do not produce them; for, although the ſenſation be ever ſo frequently impreſſed on the ſoul, deſire would never enſue, if the underſtanding did not diſcover the relation of objects to us. This is ſo true, that fools and ideots, who cannot perceive this relation, do not experience the deſire accompanying theſe ſenſations. Our paſſions therefore are not merely phyſical, ſince they are only ſtrong deſires, or ſtrong averſions ariſing ſucceſſively in the mind, during a long interval. The concurrence of three things is neceſſary to give riſe to the paſſions, viz. ſenſation; the love of pleaſure or the hatred of pain; and the judgment of the ſoul on the relation ſubſiſting between our well-being and the objects which affect us. All the paſſions are therefore mere emotions of the ſoul; and it is in this ſpiritual principle that we muſt look for the origin of pride, ambition, avarice, and even of thoſe paſſions which are altogether ſenſual *.

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* We can, by this time, judge of the errors of thoſe philoſophers, who have pretended to demonſtrate the mechaniſm of the paſſions in the modifications impreſ-

Of the Passions *in particular*.

Our different ſentiments aſſume different denominations, from their different degrees of force and duration.

When the ſentiments of love and hatred, deſire and averſion, are violent, and are inceſſantly renewed during a conſiderable time, they are denominated *paſſions*; when they are weak and of ſhort duration, they are termed *likings*.

We divide the paſſions into *predominant* and *ſubordinate*. In the latter, our hearts are influenced for a ſhort time by ſome particular ſentiment: in the former, ſome particular ſentiment reigns ſupreme in the ſoul, and lords it over every other deſire.

What Man could be more voluptuous then *Julius Cæſar*? What Man had a greater number of miſtreſſes? Beſides his wives, four of whom he divorced, he intrigued with the queen of Bythinia, *Cleo-*

ſed on the fluid of the nerves, founded on ſome phenomena ill obſerved; where thoſe writers have conſtantly taken the effect for the cauſe. See le Traité des Senſations, & des Paſſions of Le Cat, page 154, Paris edition, 1767.

patra; *Eunoe*, queen of *Mauritania*; *Poſthumia*, wife of *Servius Sulpitius*; *Lollia*, wife of *Gabinus*; *Tertullia*, wife of *Craſſus*; *Mutius*, wife of *Pompey*; *Servilia*, ſiſter to *Cato*, and with others beſides. Pleaſure, however, was not his ruling paſſion. Love, that drew off the attention of *Mark Anthony* from the management of public affairs, never loſt *Cæſar* a ſingle moment, nor made him neglect one opportunity of advancing his power.—Ambition was the predominant paſſion of Cæſar[*]. Every paſſion, more or leſs, influences the actions of men: but as the ruling paſſion is their leading principle of action, it ſtamps a general character on their whole conduct. When once it gets poſſeſſion of the heart, it governs with an abſolute ſway, continually impelling it to the purſuit of its object, independent of all the ſubordinate paſſions which oppoſe its career.

Every paſſion is grounded on love or hatred. Sometimes the paſſions are wholly confined to theſe ſentiments; at other times theſe ſentiments are found united with ſome others; as fear, hope, eſteem, contempt, relatively to our ſituation in reſpect of the object of our love or hatred, and to the merit of the object with which we compare ourſelves. Such is pride, a paſſion compoſed of the ſentiments of love and eſteem for ourſelves excluſively: ſuch is anger, a paſſion compounded of the ſentiment of ſadneſs, occaſioned by misfortunes, and of hatred for the authors of them.

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[*] Cæſar's extreme deſire of being eminent appeared even in the choice of his miſtreſſes.

The ſimple paſſions of hatred and love aſſume different denominations, according to their objects. Love becomes avarice, friendſhip, luſt, ambition; according as it is directed towards riches, a friend, women, honours.

And as every paſſion has ſome object, which affects either the ſenſes or the mind, we further diſtinguiſh them into ſenſual and artificial paſſions.

To the former claſs belong luſt, gluttony, drunkenneſs; to the latter, vanity, love of glory, and of all thoſe phantoms which opinion eſteems bleſſings, and which ſelf-love ſo earneſtly hankers after.

He muſt never have reflected on the objects of the paſſions, who knows not, that all men of good conſtitution agree as to the former claſs of the paſſions; although in the other they differ widely. All men deſire, in a greater or leſs degree, the pleaſures of the table, of the ſex, of muſic, odours, painting; but there are ſome men entirely without ambition, and others inſenſible to glory. One chiefly eſteems the trifling advantage of beauty, and ſpends his life in admiring his bodily advantages; another takes a pleaſure in diſplaying his large poſſeſſions, and is delighted with the extreme pain he gives thoſe who envy his glory and happineſs: another finds charms in an indolent life, or in the ſilent contemplation of the wonders of nature. Thus all are engroſſed by artificial pleaſures, and of theſe, each has ſome pleaſure peculiar to himſelf.

He muſt likewiſe never have reflected on the objects of our different affections, who knows not, that the number of the artificial paſſions greatly exceeds that of the ſenſual. The latter are limited to the number of our ſenſes; whereas the former, being the effect of opinion, are infinite;

nite; for the mind is inceſſantly active, and ever prone to invent novelties. The ſenſes, as it were, chain us to the earth, whilſt the imagination tranſports us above it, and, being limited by no ſpace, raiſes us above our equals, and exalts us to angels or Gods.

Refutation of a Sophiſm of HELVETIUS.

It has been ſaid, that the paſſions are only the voice of the ſenſes; and a philoſopher of the preſent age has vainly tortured his brain to explain this paradox.

It is certain, that many paſſions are dependent on the ſenſes, from the nature of their object; and many likewiſe are, in appearance, continued onwards to the ſoul by means of ſome falſe relations, concerning which, we may eaſily undeceive ourſelves: but how many of the paſſions are wholly dependent on the mind? And how many of them have only imaginary objects?

The chief happineſs in a Roman triumph was no more than the pleaſure the victor took in dragging at his car vanquiſhed monarchs loaden with chains, and in diſplaying to the gazing populace the trophies of his proueſs; and the repeated acclamations of the public? The charms of love conſiſt ſolely in the idea of being beloved by the object of our paſſion. Senſual love has merely groſs enjoyment for its end; but true love is only ſatisfied with the heart.

Let us leave the ſophiſtical author *de l'Eſprit*, to deduce every paſſion from phyſical ſenſibility; but he never can deduce from thence the love of glory, that vain incenſe which ignorance and wretchedneſs offer at the ſhrine of power, valour, and genius, and whereof great minds are ſo covetous.

To prove this, I will not plead that wit, genius, virtue, and the different ways men purſue to attain glory and fame, are not the paths which lead to fortune; that great talents are almoſt always the objects of envy; nor that, with the generality of mankind, credit is preferred to deſert; that the pleaſant companion and flattering paraſite, are more careſſed than the Man of genius and the Man of virtue. But noble ſouls, ſouls eager after glory and fame, the ſage and the hero, have been almoſt always known to flouriſh in poor countries; and if virtue has ever ſhone forth with luſtre, it has been among thoſe nations where they had no rewards, but honours, to beſtow. But of thoſe who have run in the career of glory, how many have reſiſted the temptations of luxury, diminiſhed the number of their wants, inſtead of purſuing the gratification of the ſenſes, and endeavouring to remove the inconveniencies which are the conſtant attendants on poverty? The Cynic, who ſpurned the purple and luxury of kings; who was content with frugal nouriſhment, and the tattered garb of indigence; who rolled himſelf in the burning ſand during the extreme ſummer heat, and in ſnow, during the ſevere cold in winter; and who threw away his wooden bowl, when he found he could do without it, certainly did not covet thoſe pleaſures of the ſenſes he ſo much deſpiſed; all he coveted was to be admired. How many others are there, who, ſo far from looking for the pleaſures of the ſenſes in the admiration and eſteem of mankind, have even reſigned preſent gratifications for fame?

Heraclitus [*], that he might the more entirely dedicate himſelf to ſtudy, reſigned his crown to his brother, and devoted himſelf to an irkſome and diſagreeable kind of life, which required great regularity and ſeverity of manners, with continual application; in a word, he abandoned all the pageantry and all the pleaſures of empire, to live in ſolitude and in a rigid frugality. Was his love of the ſciences owing to his paſſion for the gratification of the ſenſes? What pleaſures can the ſage propoſe to himſelf from reputation, which this monarch did not already enjoy when he wore the diadem? What advantages could he promiſe himſelf, which were not infinitely ſurpaſſed by thoſe he voluntarily reſigned?

The ſon of the tyrant *Miſo*, in the ſame manner renounced his father's crown with all the pleaſures of ſovereignty, that, free from the incumbrance of public cares, he might retire from the world, and indulge himſelf in meditation and ſolitude. What charms of phyſical ſenſibility are to be found in the auſtere lives of *Zeno*, *Cato*, *Socrates*, and other great ſouls of forther ages, inflamed with the love of glory? What other want beſides that of fame can any one have, who, though poſſeſſed of ſuperfluous riches, and though raiſed to the higheſt degree of human greatneſs by the advantages of birth, deſires to become learned? If the Man who is inveſted with the purple of kings, had not an higher motive than the hope of ſenſual enjoyments, would he not rather ſlumber away his life on the throne? Of what advantage was the public eſteem to *Cæſar*? Or is there a pleaſure attendant on virtue and knowledge, which power cannot give? To what other cauſe ſhall we attribute this eagerneſs after glory which he wiſhed to enjoy after death? From what motive did *Annibal*, *Alexander*, *Auguſtus*, *Trajan*, *Charles* the Fifth, *Richelieu*, *Chriſtina*, not content with the glory they poſſeſſed as monarchs or as heroes, aſpire to that of authors? Why did they covet to ſhade their brows with the laurels of genius? Becauſe they were greedy of honour and delicate in their choice of eſteem. Though ſurrounded with the ſplendor of a throne, they found they had not yet attained ſolid glory: and from a perſuaſion that the ſucceſs of military atchievements and victories which flattery attributed to the general or the king, often depended on circumſtances, on the ignorance or cowardice of the enemy; they diſdained a reputation they believed they had not deſerved; aſpired to that glory which is founded on perſonal merit, and ſought it in ſcience. Let us then conclude, that ſouls which hanker after glory are only inflamed with the love of that which is pure and ſolid, and covet praiſe merely for its own ſake. But why go back into remote times for proofs of a truth, whereof we have ſo many ſhining examples within our own knowledge. What but the love of fame, the deſire to hear our names mentioned with honour, and to have them recorded in the annals of hiſtory, could have produced, in our own times, ſo many actions of valour, conſtancy, and heroiſm? What but the love of whatever is noble and praiſeworthy, which begets in the heart of the wiſe an inexhauſtible found of delicate ſentiments, and enables him to poſſeſs, amidſt the diſorder of the elements and the ſhock of nature, that ſerenity which no misfortune can deſtroy? What but the imagination alone gives us, when we converſe with thoſe to whom we are connected by the endearing ties of friendſhip, that delicate enjoyment which is conveyed to the heart without any communication with the ſenſes? What but the imagination alone can produce that pleaſing languor, which delicate minds experience in the embraces of love, ſo ſuperior to the tranſports, enjoyment, and phrenzy of the ſenſes? What Man is ſo unfavoured by nature, as never to have enjoyed the pleaſures of the imagination? What ſoul ſo rude and uncultivated as to be inſenſible to their charms? Even the miſer acknowledges their power; and when he gathers the fruit which he has planted and carefully foſtered with his own hand, does he not invite his friend, and importune him to eat of it?

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[*] Tyrant of *Epheſus*.

Of comparative Force of the PASSIONS *of the* SENSES *and* MIND.

Man is not only ſenſible to the pleaſures of the imagination; not only there are ſome actions which belong not to phyſical ſenſibility, but the paſſions of the imagination may overpower the ſenſual, and do ſo very often.

Does not the coquette prefer the pleaſure of being admired to the pleaſure of enjoyment? Does ſhe not rather chuſe to excite the paſſions of her admirers, to poſſeſs them with fears, envy, and diſquietudes, and to triumph over their ardour, than to receive the tender embraces of a paſſionate lover?

Soldiers ſelected by the general to pierce through the battalions of the enemy, proud of the honour of this diſtinction, ruſh on the arms of their opponents, confront danger and death, and prefer that glorious occaſions of ſignalizing their valour in ſight of the army, to every other conſideration.

No ſacrifice is too much to purchaſe glory; the ſavages of America ſuffer the moſt cruel puniſhments without a groan, without a tear, and fear the torments of body leſs than the imputation of cowardice. Thus the gladiators at *Rome*, on receiving a mortal wound in the *arena*, viewed the effuſion of their blood with a diſdainful air; they contended with pain, and were not ſo much afraid of death, as of the diſgrace of uttering a ſigh or ſhedding a ſingle tear; and even in their laſt agonies they carefully maintained the warlike poſture, which they had been taught by the maſters in their art.

The image of pleaſure is ſweet under whatever form it appear. The proſpect of a fine country, the coolneſs of a ſtream of water in the heat of ſummer, the harmonious melody of birds, always produce pleaſure; the joys of love ever affect the heart with a gentle delirium; yet none but pleaſures of imagination fire the heart, raviſh the ſoul, and occaſion its tranſports.

Of the Unfolding of the Powers of the SOUL.

Let the ſoul exiſt, if any one will have it ſo, before the body to which it is united; and even in that pre-exiſtent ſtate poſſeſs a different mode of perception and underſtanding; yet is certain that, when it has once become ſubject to the laws of this union, it no longer retains any of its former ideas, not even the conſciouſneſs of its pre-exiſtence.

We diſtinguiſh in the ſoul five faculties, none of which is unfolded at our birth. Our ſenſibility is not then developed, neither is the underſtanding, every idea being founded on ſenſation; the memory and the will are alſo undiſtinguiſhable; for, to remember objects, they muſt firſt have been perceived; and to *will*, we muſt have perceived, known and remembered them. None of theſe faculties has a determinate object, not even inſtinct; for although it is ſufficient that it perceive its object, to have a propenſity towards it, yet it certainly muſt have perceived it. The ſenſitive principle muſt therefore be firſt unfolded in the mind; but the ſenſibility of the ſoul being a purely paſſive faculty, it would for ever continue unexerted, if external objects did not produce their impreſſions by the aid of the ſenſes. Deprive the body of theſe organs, convert it into an inſenſible machine, and imagine the ſoul for ever confined in this machine; that inſtant, all theſe faculties are loſt, and the ſoul itſelf is reduced to a ſtate of inſenſibility. The ſenſibility of the ſoul muſt therefore receive objects from the ſenſes, before it can receive them from the underſtanding; hence it is evident, that the ſoul muſt firſt perceive by means of the body, before it is capable of perceiving of itſelf.

Hence, though poſſeſſed of the faculty of perceiving, judging, recollecting and chuſing, the ſoul could neither perceive, recollect, judge, nor chuſe, unleſs united to an organized and ſenſible body; it would not even be conſcious of its own exiſtence, for it is only by reflecting on its ſenſations, it acquires this conſciouſneſs.

Next after ſenſibility is unfolded inſtinct; then memory; after that the underſtanding, and laſt of all the will: however ſingular this gradation may appear, it is however the order obſerved by nature in the unfolding of our faculties.

With regard to the time when this unfolding is accompliſhed, it varies with the conſtitution of each individual; but this variation is inconſiderable. While the infant is in the womb, its organs are not in a ſtate adapted to receive a perfect ſenſation; beſides, in the fluid wherein it is contained, it is incapable of receiving any ſenſation, not even that of the fluid; juſt as we perceive not the air when calm, ſerene, and of equal temperature. But in a few days after birth, its ſenſes are in a ſtate adapted to receive the impreſſion of objects; the ſenſitive principle then expands,

pands, and begins to exert itſelf. The ſenſitive faculty is ſoon ſucceeded by that of the memory; the underſtanding preſently follows; the infant compares its ſenſations as ſoon as it acquires the uſe of its ſenſes, and in a ſhort time is able to diſtinguiſh them. All this is done in about forty days; by this time the infant already knows its nurſe. The unfolding of the will immediately ſucceeds; for it is not long till the infant can diſtinguiſh the different objects of its ſenſations, and know pleaſure and pain: from this inſtant the innate deſire of happineſs has its determinate object, and the will purſues ſome known good. Thus all the faculties of Man are rendered active a ſhort time after birth; but there paſſes a conſiderable ſpace of time before they are perfectly developed. The infant has at firſt only particular ſenſations; objects appear unconnected, and it diſtinguiſhes them only by their different ſenſations: when the number of theſe ſenſations are multiplied, the child compares them, perceives their identity or difference, begins to range them in certain claſſes according to analogy, and to form ideas.

I have diſtinguiſhed the operations of the underſtanding into reaſon and imagination: by the former the ſoul perceives the real relations of objects; by the latter, it invents imaginary ones. Theſe different operations require very different qualities in the perſon who judges. To judge of true relations, it is ſufficient to examine objects; the mind then determines ſpontaneouſly: but to invent ſuch relations as are directed to ſome end *, a great number of things muſt be firſt known; we muſt then retire within ourſelves, and ſilently combine them in many different ways; as this requires reflection, it is impracticable in the early part of life, an age entirely engroſſed by phyſical ſenſibility and by ſleep. The imagination cannot therefore be developed very early in life, and a longer ſpace of time ſtill muſt elapſe, before any moral ideas can be acquired.

Every relation perceived between different objects forms an idea; every idea is an abſtract ſenſation, but every kind of ideas is not equally acquired.

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* I here mean regular invention.

The firſt that offer to the mind are thoſe which have for their objects the phyſical relations of beings; afterwards thoſe which have for their objects moral relations, ſo difficult for mature age to acquire, and impoſſible for infancy, although this age give many apparent ſigns of theſe ideas *.

Of the Exerciſe of the Powers of the SOUL.

Each of theſe powers has its ſeparate functions, but they cannot act ſeparately; for, to produce thoughts, deſires or paſſions, they muſt unite and act in concert. Thus all the powers of the ſoul act in conjunction, and their operations are produced by their combination.

It is of conſequence that the point which ſeparates the operation of the different mental powers be exactly defined, which no one has hitherto done.

Although the unfolding of the faculties of the ſoul conſtantly require the aſſiſtance of the ſenſes, yet when the ſenſations are once received, theſe faculties can perfect the whole without their concurrence. Obſerve thoſe who walk in their ſleep; you will ſee them get out of bed, go backwards and forwards, traverſe different apartments, act, ſtand in a muſeful attitude, and go about their affairs as when awake. All the powers of the ſoul are at that time in action, ſenſibility, inſtinct, ſelf-love, memory, judgment, will, all but the organs of ſenſe; ſuch perſons being without any knowledge of their actual ſituation, and ignorant of the danger that attends them. During the whole time, the ſoul ſeems detached from the body, and man appears an automaton in motion *.

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* When infants are cauſeleſly beaten, or deprived of their toys, it is not from any ſentiment of the injuſtice done them that they cry, but from a painful ſenſation excited by the blows, or from the chagrin of being deprived of the object of their pleaſures, and from the loſs of their amuſements.

Although the faculty of thinking is inherent in the ſoul, it nevertheleſs does not always think. How frequently, in the courſe of our lives, is the mind entirely engroſſed by ſenſibility, while all its other faculties are ſuſpended? Upon hearing any dreadful news, the blood chills, the

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* It may be here obſerved, that this power of the ſoul to detach itſelf from the ſenſes, proves it to be diſtinct from the body, much better than the unintelligible jargon of metaphyſicians.

heart violently contracts, reaſon is extinct, and the ſoul recoils within itſelf, and is inſenſible to every thing but its calamity. In acute pain we have no internal ſenſation but that of our ſufferings. Hence there are moments, when the ſoul does not think, and theſe are ſometimes ſufficiently long. Have you never obſerved the ſurprize of a clown, when he firſt enters the theatre; at the riſing of the curtain, ſtruck with the wonders which preſent themſelves to his ſight, abſorbed by objects ſo uncommon, and as if he were beſides himſelf in that enchanted place, he never once reflects, but is entirely employed in contemplating the ſcene, and his whole ſoul reſides in his eyes.

We can likewiſe ſuſpend the activity of the judgment at pleaſure, and leave ſenſibility to act alone. A lover of harmony, or eloquence, on hearing a beautiful paſſage, or pathetic deſcription, retires within himſelf, and is, as it were, concentrated in his ſenſibility. Does not an enthuſiaſt, in the heat of devotion, ſometimes ſuſpend the activity of his judgment, that he may indulge himſelf in the enjoyment of a temporary ſentiment that charms him?

What man, who has been accuſtomed to think, is not convinced of this truth from his own experience?

Senſibility may alone occupy the ſoul entire; the underſtanding never can: for, to enable the underſtanding to judge, there muſt be at leaſt two ſenſations preſent in the mind, the ſubject and the attribute *. The underſtanding and ſenſibility are then united into one ſingle act, in all our judgments. Memory is added thereto very often; for the underſtanding judges equally of paſt and preſent ſenſations.

The memory cannot at any time operate alone; for all things being diſpoſed in this receptacle, are, as it were, in a ſtate of non-exiſtence, till the underſtanding recalls them to the mind: this faculty there-

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* It ſometimes happens, that the ſubject is not a body, as in this propoſition, *God is juſt*; but we never repreſent a ſpirit, otherwiſe than in a corporeal form, or rather, we never repreſent it at all. The attribute is almoſt always a ſenſation, as in thoſe abſtract ideas; *warm*, *hard*, *great*, *good*, *fine*. This is ſo true, that we cannot form any notion of *extenſion*, *gravity*, *beauty*, and of ſeveral other abſtract ideas, but by referring Man to his ſenſes. Every idea of this kind is therefore, properly ſpeaking, an abſtract ſenſation.

fore

ſore always requires the concurrence of the underſtanding in its operations.

Finally, as the will is often directed by the underſtanding, it always requires an object to be ſupplied by ſenſibility, or by the memory; it cannot act, unleſs at leaſt one of theſe faculties concur.

Of the Exerciſe of SENSIBILITY.

Senſibility can not only occupy the whole ſoul, and muſt not only concur in every operation of the mind, but is inceſſantly in action. While the ſoul continues united to the body, it is continually affected with ſome ſenſations, ſome new ſentiment, or ſome ſentiment reproduced. We may eaſily be convinced of this, by obſerving what paſſes within ourſelves.

The ſoul may be affected with many different ſenſations at once; becauſe many ſenſes can be affected, and the ſame ſenſe may alſo be affected many ways, at the ſame time.

The number of theſe different ſenſations is very great; neither is it poſſible to determine where it ends, as it is impoſſible to fix the number of different objects, which may act together on the ſenſes; but the number of different ſenſations, with which the ſoul may be affected without confuſion at the ſame time, is much more confined. On hearing a very complex muſical compoſition, the ear is affected by every ſound of the ſeveral inſtruments, but without being able to diſtinguiſh them *. But whatever their number may be, to enable the ſoul to diſtinguiſh the different ſenſations which affect it at the ſame time, they muſt not be very lively; for if, among theſe ſenſations, there be one much ſtronger than the others, it weakens them to ſuch a degree, as nearly to annihilate them, and this with an energy proportioned to its ſtrength. There is likewiſe in ſenſations a degree of force which abſorbs all our ſenſibility, as if in theſe moments the heart could not divide itſelf. It is thus, whilſt in the arms of a beloved miſtreſs, that ſo many agreeable ſenſations ariſe ſucceſſively; but in

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* I have ſeen in London a young performer on the harpſicord, that could diſtinguiſh the different tones of the ſtrings vibrating together, when any one applied the fingers to the keys of the piano forte, or any other inſtrument of the kind.

that happy moment which is the *acme* of our pleaſures, amidſt the delights in which we are loſt, the ſoul is only ſenſible to the moſt ecſtatic, viz. to the prolific fluid as it is diſcharged through the numerous circumvolutions of its veſſels.

When the ſoul is abſorpt by any ſtrong ſenſation, it continues in that ſtate until this impreſſion inſenſibly decaying comes to be perfectly extinct, or until a ſenſation yet more ſtrong takes place.

The ſoul cannot be affected by many ſentiments at one time, as it is by many ſenſations; for the ſenſes, which communicate the impreſſions of objects to the ſoul are many, whilſt the underſtanding, which diſcovers their relations, is but one. And it has been proved, that ſentiments ariſe in the ſoul by the relations which Man perceives between himſelf and other beings. The ſenſes may likewiſe be affected many ways at the ſame time, whilſt the underſtanding can fix on one relation only, as I ſhall hereafter prove. There is, therefore, at one time, but one ſentiment in the ſoul, although it appear to be affected with a thouſand emotions at once. But as this operation of the underſtanding is performed with inconceivable velocity, theſe ſentiments ariſe, and are ſucceeded with ſuch rapidity, that it is often impoſſible to diſtinguiſh the infinitely ſmall interval which ſeparates them, whatever attention we may give to what is at that time tranſacting in the mind.

This is the reaſon why a thouſand ſad and agreeable ſentiments ſeem to divide the ſoul between them, and why we ſuppoſe it to be at once diſtracted with pain, and tranſported with joy.

However impoſſible it may be to diſtinguiſh, by the internal feeling, the interval ſeparating theſe rapid emotions, it is more ſo to diſtinguiſh them by their external ſigns; becauſe the impreſſions of the ſentiments, made on the corporeal organs, are much more durable than thoſe made on the ſoul. Hence when the ſoul is ſucceſſively under the power of impetuous emotions, which rapidly ſucceed each other, their different impreſſions on the body continue together. Obſerve the unhappy father, who conducts his only ſon to the altar of death; at the very time when the fear of the gods arms his hand, and he applies the knife to the boſom of his child, paternal affection ſuſpends the ſtroke, and he melts into tears.

If the ſucceſſion of the ſentiments of the ſoul be often imperceptible, it nevertheleſs may ſometimes be perceived. There are but few who are accuſtomed to examine what paſſes within them, who have not obſerved, that often, amidſt the agitations of the mind, a ſentiment ſhall ariſe and deſtroy that which preceded it; that though the ſentiments are ſucceſſively effaced in a diſturbed mind, they yet ſpring up again inſtantly after; and laſtly, that the ſoul, unſettled, wavers between its different emotions: juſt as, in a ſea agitated by the winds, we obſerve the waves break one againſt the other and inſtantly reappear.

In the conflict of the different ſentiments with which the ſoul is ſucceſſively agitated, as in the concourſe of the ſenſations, the ſtrongeſt always weakens the others, deſtroys them, and reigns alone in the ſoul.

When the friends of *Pompey* lamented his defeat after the dreadful ſlaughter at *Pharſalia*, ſeized with fear at the approach of the Egyptian veſſels, their grief made them dumb; each ones particular danger prevented his being concerned for the common misfortune; they thought only of encouraging the ſailors, and ſeeking their ſafety by flight: as ſoon as their fears were removed, the loſs they had ſuffered again came into their minds, and they again melted in tears. Thus nothing but extreme pleaſure can entirely deliver the ſoul from profound grief; nor can any thing but intenſe pain create ſadneſs in an heart overflowing with joy; every weaker affection glances, as it were, on the ſoul, and makes no laſting impreſſion on it.

But when theſe ſentiments are nearly of equal force, the ſoul, as if unſettled and wavering between contrary emotions, knows not which to reſolve on; its deſires deſtroy each other; ſcarce is it freed from its troubles, when it is involved in them anew; this indetermined ſtate does not always terminate to the advantage of the moſt powerful ſentiment. After a long conflict, the ſoul, wearied out with the efforts it has made, gradually loſes its ſenſibility and force together; and finally yields to the laſt impreſſion, which thus remains maſter of the field.

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There is this difference between the ſucceſſion of ſenſations and that of ſentiments; in the ſucceſſion of new ſenſations, only the ſenſibility of the ſoul and the organs of ſenſe are in action: but in that of the ſentiments, ſenſibility, underſtanding and memory, muſt always concur: for it is the underſtanding, which, by the aſſiſtance of analagous ſenſations, furniſhed by the ſenſes or by the memory, gives riſe to our ſentiments, and occaſions their ſucceſſion. When the ſenſations which thus ſucceed each other, inſtead of being then newly produced, are only renewed, the ſame faculties are in action as in that of the ſentiments.

The duration of ſentiments is very long when theſe emotions are violent, and extremely ſhort when they are weak; but in general their duration is not near ſo much confined as that of the ſenſations. Anger and fury are of longer duration than the ſtrongeſt impreſſions of objects on our organs*. Avarice, that ſordid ſentiment which day and night engroſſes thoſe baſe minds which are infected with it, is of yet longer continuance. The ſame may be ſaid of jealouſy, that tyranical ſentiment, and the conſtant companion of ſuſpicion, which haunts the wretch it has taken poſſeſſion of, and ſuggeſts to him the idea of diſhonour though in the embraces of the beloved object of his deſires, ſo that he groans under a load of bitterneſs even when the ſenſes are laid a ſleep.

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* We muſt not rank as ſenſations, thoſe which proceed from ſome diſorder in the organs, nor thoſe which are continually produced by new impreſſions, as the pain occaſioned by a wound.

Of the Exerciſe of the UNDERSTANDING.

Let us here diſtinguiſh exactly what is peculiar to the underſtanding while in exerciſe, from that which is peculiar to the other faculties. Thinking is a property of the underſtanding, but the underſtanding alone is not ſufficient to produce it. The judgment is employed in determining the relations of things, and as we may either judge of abſent objects or of thoſe which are preſent, ſenſibility and memory therefore are combined with the underſtanding in forming our judgments, as has been already obſerved: in theſe two faculties the underſtanding perceives objects, in the ſame manner as we behold ourſelves in a glaſs, if I may be allowed to make the compariſon.

Our judgments are often formed without our concurrence, and ſometimes in ſpite of our utmoſt efforts to the contrary; in ſuch caſes, the will has no ſhare. But if thought ſometimes take place without the concurrence of the will; at other times, the will concurs with ſenſibility and memory in the excerciſe of the underſtanding; for the underſtanding is a faculty, the exerciſe whereof we can ſuſpend and govern as we think fit. We can at will, determine the ſoul to the conſideration of external objects, and afterwards turn our thoughts inwards within the mind, in order to compare and combine them in different manners at pleaſure, and judge of their relations. The exerciſe of the underſtanding is therefore both voluntary and involuntary. I have diſtinguiſhed two different powers in the underſtanding: that of perceiving, examining, and comparing objects; and that of judging of their relations. It is the firſt only of theſe powers which concurs with the will; for we cannot refrain from judging of any relation which preſents itſelf to the mind. If, however, we at times can ſuſpend our judgment, it is by prolonging the exerciſe of the former of theſe powers, without which there can be no judgment, and not by employing the other.

The voluntary uſe of this power conſtitutes attention; for what is the attentive conſideration of any object, but the fixing the exerciſe of this intellectual faculty on its impreſſion, communicated to the ſoul by the organs of ſenſe, or preſerved by the memory?

As we can perceive a certain number of ſenſations at once, our attention may be ſhared among a certain number of objects; but the ſmaller this number of objects is, *cæteris paribus*, the ſtronger is the attention, and *vice verſa*. This is evident in abſence of mind, but much more ſo in the catalepſy *, a diſorder wherein the ſoul being entirely ingroſſed by intenſe thought, appears to have no communication

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* The catalepſy is a very uncommon indiſpoſition of the ſoul. Phyſicians have hitherto, without reaſon, taken it for a diſeaſe of the body, and have treated it as ſuch. But a more attentive conſideration of the phenomena of nature would have convinced them, that it is only a ſimple affection of the ſoul; as the body

body is at ſuch a time in perfect health, and regularly performs all its functions. The catalepſy is, properly ſpeaking, but intenſe thought, wherein attention is carried to the higheſt poſſible degree, or, if you will, wherein the ſoul is violently affected, and, as it were, concentrated within itſelf. Hence none are ſubject to the catalepſy but perſons of great ſenſibility, and ſuch as are affected by exceſſive pleaſure or exceſſive grief, which, as they dare not confide to any one, they are condemned to mourn or rejoice inwardly. Such are hypochondriacs, devotees, enthuſiaſts, amorous perſons, but more eſpecially ſedentary women, whoſe paſſions are naturally more violent than thoſe of men, and whoſe inactivity continues the mind intent upon the object which has once got poſſeſſion of it. We ſhall be eaſily convinced of this, if we conſider the ſymptoms which accompany this ſuppoſed malady. Of the following caſe I myſelf was witneſs. A woman of a very choleric temperament, and much given to the reading of books of devotion, had all the ſymptoms which are found united in the moſt complicated caſes: ſhe was ſubject to frequent wanderings in her diſcourſe; which ſhe would break off abruptly, and become motionleſs; her eyes remained open and fixed, but ſhe could neither ſee, hear, nor feel; ſhe felt no pain from punctures in her fleſh, and was inſenſible of the moſt violent agitations: like a ſtatue of ſoft wax, her limbs were flexible, and retained any poſture in which they were placed by chance or otherwiſe; her pulſe not only continued to beat, but was even quicker than uſual, and her com-

plexion

with the body. Undoubtedly the force of attention depends on the number of objects which the underſtanding conſiders at once; yet it likewiſe depends on the force of the

will;

plexion likewiſe was more florid and lively; after continuing in this ſituation for ſome time, her body began to move, like a perſon awaking from a troubleſome ſleep, fetching many deep ſighs; ſhe gradually recovered, but retained no remembrance of what had paſſed, and with a ſeeming extaſy related her viſions. Now wherein does this ſtate differ from that of a ſtudious perſon, who indulges himſelf in profound meditation, except in that it is a ſtronger attention? And are not theſe the viſions of a ſoul moſt violently affected?

But ſome will reply, that a great diſorder of the organs of the head has been diſcovered by diſſection in perſons who have been ſubject to the catalepſy. "In ſome, the veſſels which paſs from the baſis of the *cerebrum* to the *ſinciput* were diſtended with thick blood, and the poſterior part of this viſcus was humid with ſeroſities; in others, the anterior part of the *cerebrum* has been found hard, its baſis ſoft and humid, and the principles of the nerves ſmall and dry." But what does this prove? What are theſe appearances but the natural effects of the violent tenſion of the muſcular fibres, and of the loſs of ſpirits which ever accompanies profound meditation; as I ſhall hereafter demonſtrate? Are not the *ſtaſes* of fluids, and the obſtruction of veſſels, the ordinary effects of that diminution of organical elaſticity, which enſues from this violent tenſion? Is not the extravaſation of the ſerous part of the fluids

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will; for the will is ſuſceptible of different degrees of intenſeneſs, as are the motives determining it. We can at pleaſure uſe efforts more or leſs violent, to conſider an object; we can diminiſh attention, or augment it to ſuch a degree, that it ſhall appear entirely to engroſs the ſoul.

Some perſons, like the prieſt of *Calames* *, have the faculty of being ſo affected at will, as to become inſenſible of what happens to the body.

The faculty of judging is natural to the ſoul, but is properly free only when ſen-

the neceſſary conſequence of the ſtaſes? Is it not evident that phyſicians, in their ſagacious reſearches into the cauſes of this imaginary diſeaſe, have taken the effect for the cauſe, when they cited theſe obſervations? And is it not likewiſe evident, that the catalepſy is no diſeaſe of the body.

A circumſtance which yields the moſt demonſtrative evidence, and proves the ſound ſtate of the organs of the head in this ſuppoſed malady is, that in the loſs of knowledge, which ſucceeds the diſorders of this organ (ſuch as the intumeſcence of the brain and inflammation of its membranes) the ſoul loſes every degree of ſenſe, as in the apoplexy, ſycopes, deliquia, but is conſcious of its condition in the catalepſy.

* See Auguſtine de Civitate Dei, Lib. xiv. cap. 24.

ſibility is not affected by any object beſides those of our judgments: when the ſenſations are ſtrong, they always diſturb the exerciſe of thinking; when extremely ſo, they deſtroy it entirely. In this latter caſe, there is no judgment; becauſe the mind is entirely engroſſed by a new object: in the firſt caſe there is, it is true, a judgment, but this is an erroneous one. The new ſenſations, not having ſufficient force entirely to engage the attention, divide it; being thus obliged to employ it on different objects, the mind cannot ſufficiently conſider thoſe of which it is to judge; ſo that it confounds them, and forms falſe and abſurd judgments. This is very evident in perſons agitated by paſſions. Amidſt their emotions, the ſoul cannot come to any prudent determination; ſometimes it forms a multitude of weak reſolutions, and extravagant projects, and is unreſolved which to prefer; at other times, full of the object by which it is affected, it confounds every thing in the judgments it makes with this object, and is no longer attentive to reaſon. This is the cauſe why profound meditation takes place only when the paſſions are calm, in ſilence and in ſolitude.

The exerciſe of the underſtanding is either reſtrained or interrupted when ſenſibility is ſtrongly affected; and, by a very ſingular phenomenon, when the underſtanding is cloſely employed, the impreſſions of external objects upon the ſenſes appear weakened, ſometimes null, as we obſerve in abſent perſons *, *in thoſe who walk in their ſleep*, and in cataleptics. Hence, if our thoughts be not perfectly free, except when our ſenſibility is not engroſſed by any ſenſations, beſides thoſe which are the objects of our judgments; ſo neither are the ſenſations in their full force, except when the underſtanding is totally inactive. Not that the exerciſe of this faculty interrupts the commerce of the ſoul with the body, as ſome have ſuppoſed; the underſtanding neither adds to, nor takes from the force of theſe ſenſations, and they remain perpetually the ſame; it is becauſe we judge not until the underſtanding has conſidered the objects of which it is to judge; that is, we never judge without employing attention: and becauſe without attention, the impreſſions of objects on our organs, and even the ſenſations renewed by the memory are, to the ſoul, as if they had no exiſtence: it therefore appears, that the ſoul cannot be attentive to ſenſations from without, when it is immerſed in profound meditation.

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* This is the reaſon why an abſent perſon ſometimes looks for his ſpectacles and has them upon his noſe, and why cataleptics have no knowledge of what is acting about them.

There may be many ſenſations in the ſoul at one time, but never more than one judgment; the faculty of judging not being diviſible like that of perceiving. It is in ſenſibility, and in the memory that the underſtanding perceives the objects of its judgments; and the number of theſe objects may be as great, as that of the different ſenſations, which the ſoul can receive at the ſame time. The mind may very eaſily perceive all theſe objects at once, but to judge of their relations, it muſt compare them, examine them one after another, in ſome determinate point of view, and reduce them to a fixed ſtandard: now the mind can examine objects, but in one point of view at a time. Thus the underſtanding can, at the ſame time, perceive only one of their relations, and there can be only one judgment at a time in the ſoul.

Natural Succeſſion of the THOUGHTS.

Since the underſtanding in its operations is combined with the will, the mind can transfer at pleaſure its thoughts to different objects, without any connexion of ideas, and form what we may term ſeparate judgments; but this is not the order which the mind purſues in thinking, when left to itſelf.

When we reflect on the almoſt imperceptible connexion obſervable in the ſucceſſion of our ideas, and obſerve their dependencies, we evidently perceive, that the mind, in its progreſs, always proceeds by analogy. When we are alone walking in the fields, if a voice much reſembling that of a friend, ſtrike the organ of hearing, or a colour like that of his coat occur to the ſight, his image immediately preſents itſelf to the mind, we recollect ſome peculiar circumſtance, and recall ſome former diſcourſe.

Thoſe analogies, which conſtitute the aſſociation and link of our thoughts, are not always perceived; but they rarely eſcape us, if we recollect ourſelves, and leiſurely obſerve the progreſs of the underſtanding. I have frequently entered into an examination of what paſſed within me, and have, if I may venture the expreſſion, caught the ſoul in the act, on the relations which formed the aſſociation of my ideas. Hence it is evident, that the mind proceeds only by analogies, both when it is wrapt in profound meditation, and when abſorbed within itſelf; and never appears to rove from thought to thought, nor from one ſubject to another, however extravagant or unconnected its thoughts may appear; ſome relation, either ſlight or ſtriking, forms the tranſition, and ſome analogy perceived, either real or apparent, preſents the new object to the mind; if we except the ſingle inſtance when the ſoul, forced from its preſent thoughts by ſome violent and ſudden ſenſation, interrupts the ſucceſſion of ideas, and the progreſs of the underſtanding. Thus all our ideas are connected by an immenſe chain, all the links whereof have ſome common relation.

In what Manner THOUGHT *becomes* REASON *or* IMAGINATION.

I have ſaid that reaſon judges of the true relations of objects, and that the imagination invents ideal ones.

To judge of the true relations of objects, they muſt be always preſent in the mind, and be ſubject to attentive examination; but attentive examination is not always neceſſary to invention; for in theſe caſes it is ſufficient to connect the qualities of one ſubject to thoſe of another, and to confound them in the ſame whole. If we attentively follow the progreſs of the underſtanding, we ſhall be convinced, that thought always becomes imagination when it ceaſes to be reaſon, and that in the point where the one ends, the other begins. When attention is diſcontinued, the object which engaged us is no longer fixed; it therefore changes to the firſt ſenſation with which the ſoul is afterwards affected; the mind employed on this new object combines it with every thing that offers, as it happens in thoſe indeterminate reveries, into which the ſoul falls after long meditation, or in thoſe gentle dreams which ſucceed laborious exerciſe. Hence thoſe extravagant fictions, and phantaſtic ideas, we have in our dreams.

The object of our thoughts changes with every new ſenſation which affects the ſoul; but, for want of the action of external objects on our organs, this ſenſation is almoſt continually ſupplied by the ſoul itſelf, led by a ſecret bias towards the moſt alluring object. The imagination is therefore directed to its object by the paſſion, and the nature of its thoughts is determined by that of the ſentiment which affects us. Whilſt the ſoul is under the power of any gentle emotion, the mind employs itſelf in augmenting its pleaſures; then retiring within itſelf, it ſecretly combines this ſentiment with ſome analogous object, from which it derives ſimilar ideas. Theſe are thoſe pleaſing fancies, and flattering deluſions, which conſtitute the chiefeſt enjoyments and principal happineſs of our tranſitory exiſtence. This is the caſe in the delirium of love: during its continuance we enjoy a flattering dream; the mind is for ever recalling the object of its paſſion; it engroſſes our whole thoughts, until ſome more powerful ſenſation awaken us from our trance, and bring us back to ourſelves whether we would or no[*].

I have ſhewn how judgment becomes reaſon or imagination, according to the manner in which the mind judges of the relations of objects; and alſo how it ceaſes to judge of their true relations, when attention is diſcontinued. Hence *the underſtanding is always ſubordinate to the will, in reaſon, as it is likewiſe ſometimes in imagination, and ſometimes it is wholly free.*

Farther Obſervations on the Exerciſe of the UNDERSTANDING.

Of WISDOM *and* MADNESS.

Thinking is a power inherent in the mind, but is, in its natural ſtate, without rule, choice, or attention: all our judgments are at this time irregular and incoherent, nor is there any neceſſary connexion between the ſubject and the attribute. This is obſerved during ſleep: when the ſenſes are at reſt, the mind diſports with different objects, and forms, by an aſſemblage of thoughts and ſenſations, thoſe wild rambling fictions, which are the uſual illuſions of the night.

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[*] This is the reaſon why imagination never operates to greater advantage than in ſilence.

When the underſtanding continues to operate in Man when awake, in the ſame manner as when he is aſleep, this accidental ſtate thus become permanent, is termed *madneſs*: but when our judgments are regular, and there is a connexion between the ſubject and attribute, this order of our thoughts is called *wiſdom*. What conſtitutes the whole of the difference between wiſdom and madneſs is therefore attention, which is always attendant on the latter, but never on the former; for we may indeed think without this diſpoſition of the mind, but cannot reflect. If the child that prattles, and the old man who dotes, are both of them incapable of reaſoning, it is not becauſe they have no ideas, as ſome have imagined, but becauſe they are equally devoid of attention: one has never poſſeſſed it, and in the other, it is * decayed.

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* The reaſon of this I ſhall aſſign hereafter.

This want of attention, which is the cauſe of madneſs, is manifeſt in thoſe extraordinary perſons who extravagate upon one ſubject only. I have known ſome diſcourſe with great good ſenſe on all kinds of ſubjects, one particular topic excepted: in ſuch caſes, the mind, engroſſed by the object which affects it, loſes ſight of every other, and taking this object for the ſubject of its judgments, annexes to it every kind of attribute indiſcriminately.

The ſame phenomenon likewiſe appears in violent paſſions, which occaſion a kind of momentary madneſs. Moraliſts mention another ſpecies of madmen; a name which they apply to thoſe whoſe diſcourſe is unfaſhionable, and conduct altogether ſingular; that is, whoſe madneſs is out of the common road: in this ſenſe *Democritus*, *Diogenes*, *Heraclitus* were madmen; with others of peculiar modes of thinking and living, in every age.

Of regular THOUGHT, *conſidered relatively to the Degrees of Attention it requires.*

The faculty of perceiving, comparing, and examining objects, in conjunction with the will, is the cauſe of reaſon and regular thought *. Regular thought takes different denominations, according to the different degrees of attention the mind requires in forming its judgments, combined with the nature of their objects, and the direction of the exerciſe of the underſtanding. It retains the generic appellation of *thought*, when this degree of attention is ſmall, whatever may be the object of our judgments and duration of this exerciſe. It is called *reflection*, when this degree is more conſiderable; and *meditation*, when it is extreme.

To reflect, is to think attentively; but reflection differs from thought, in ſo far, as the latter is applied to every kind of object indiſcriminately; whilſt the former takes place with regard to abſent objects only; that is, with regard to thoſe which are renewed by the memory: for to reflect, is to examine whether our thoughts be true; it is the comparing our judgments with their objects, and aſcertaining known relations. Thus, after having applied our ſoul to the perception of external objects, we retire within ourſelves to conſider, compare, and combine them after various manners.

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* That is, thought directed to ſome end.

Meditation has the ſame objects which reflection has, but it differs therefrom not only in the degree of attention, as I have already obſerved, but alſo in the duration of thought: reflection is the aſſemblage of many thoughts in ſucceſſion; meditation is a long ſeries of deep reflections.

Regular thought is a painful and irkſome ſtate of the mind. If our inward feelings afford not ſufficient documents of this, it will be eaſily proved by what paſſes within us in conſequence of our external actions.

Examine Man during infancy: whilſt at liberty, he indifferently follows every path that leads to pleaſure, obeys every impreſſion of external objects, amuſes himſelf with exerciſe, goes, comes, runs, ſtands ſtill, and acts ever without any purpoſe, and from no motive whatever; he thinks very little, reflects yet leſs, and never meditates at all. If at any time he reſt, or direct his actions to ſome end, or if he reaſon ever ſo little, it is always by compulſion, becauſe he hears his maſter's voice, and feels the yoke of neceſſity. But as ſoon as he is out of the ſight of his troubleſome guardians, he reſumes his character, and thinks no more than juſt what he cannot help, and then only that he may give full ſwing to the impulſe of the ſenſes: thus a ſpring compreſſed regains its elaſticity, when the compreſſing power is removed.

Neceſſity obliges Man to reflect in infancy; the ſame cauſe likewiſe obliges him to reflect when arrived at maturity. Nothing but the ſenſe of preſent, and the apprehenſion of future wants, can impel the mind to reflection. It is the paſſions which give riſe to the productions of genius, and to the wonders of art: without theſe powerful incentives, the mind would languiſh in liſtleſs indolence; and men, like ſavages, would ſpend their lives in a momentary contemplation of the objects ſurrounding them, or elſe, in ſleep.

But if thought be painful, it is only in proportion to the degree of attention it requires, and to the efforts more or leſs ſtrong, which are neceſſary to the knowledge, or to the formation of relations. Thus the ſtudy of geometry, of the mathematics, and of every ſcience which requires cloſe attention, are extremely toilſome;

ſome; whilſt thoſe which require but little application ſcarcely give any fatigue.

Of PENETRATION, STUPIDITY, SAGACITY, *and* DULNESS.

From the faculty of judging, combined with the number of our ſenſations and ſentiments, and from the chain of our ideas, reſults a greater or leſs aptitude to diſtinguiſh the relations of things, denominated *penetration* and *ſtupidity*.

All objects are naturally unconnected, nor is there any connexion between them perceptible to Man, when firſt he takes a view of nature, even ſuppoſing all his faculties to be perfect: the admirable chain connecting every part, is evident to him only, who has compared a multiplicity of things in many different ways; in ſhort, is only diſcernible by a philoſopher. But as the knowledge of a ſingle relation requires a great number of ſenſations, it is very evident, that the man who poſſeſſes but a few, muſt neceſſarily be ſtupid, and that his apprehenſion muſt be the more acute, in proportion as their number is greater.

Suppoſing Man without ſenſations, and at the ſame time endued with the faculty of thinking, he muſt neceſſarily be ſtupid; he muſt likewiſe be ſtupid, with the faculty of thinking, and tho' he have many ſenſations and ideas depoſited in the memory, if he be deſtitute of the power to recall them. It is the underſtanding only which, by the aid of analogy, recalls our ſenſations and ideas; but their reproduction, which takes place in the natural ſucceſſion of our ideas, being without relation to any fixed deſign, conduces nothing to penetration. No ſenſation, ſentiment, or idea, tranſmitted to the memory, has any effect, if the power of recalling thoſe which are neceſſary to diſcover the relation we deſire to know be wanting. Penetration therefore depends on the power of recalling thoſe ſenſations and ideas which are analogous and correſpond with each other.

Penetration, combined with the time which the mind requires for diſcovering the relations of objects, becomes either *ſagacity* or *dulneſs*. Sagacity, when the time is extremely ſhort*; dulneſs, when very long.

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* Sallies of will, which are ſigns of ſagacity, ariſe from the rapidity with which the mind forms an analogy.

Sagacity depends on the choice which the underſtanding makes of ſenſations and thoughts; and on the order in which it arranges them in the memory. The greater analogy theſe ſenſations and theſe thoughts have to the relations ſought, the more eaſily the mind diſcovers theſe relations.

A mind, ſagacious in the ſmalleſt degree, eaſily ſolves certain abſtract queſtions, with which it has been converſant for ſome time. It is ſurprizing to think how readily it gives the ſolution of them, notwithſtanding the numberleſs obſtacles which oppoſe its progreſs: on the contrary, if you propoſe, to a genius of the firſt claſs, a queſtion, which may be ſolved with little difficulty, and about which he has been little converſant, he will heſitate like a very dunce.

Newton, whoſe ſagacious mind ſoared to heaven with a bold and rapid flight, and diſcovered the ſyſtem of the univerſe, was as ignorant in religious matters as any among the vulgar; and it is certain, that they who apply themſelves to the ſtudy of enigmas, unravel them much more readily than the moſt ſubtil philoſophers.

Some ſingular Phenomena explained, concerning the Effects of the Paſſions on the UNDERSTANDING.

How different is the proſpect of nature, according to the different ſentiments which affect us!

In the horror of deſpair, rage and ferocity are accounted heroiſm. In the fury occaſioned by ſlighted love, we look on every woman as perfidious; if a miſtreſs prove falſe to us, from her we eſtimate the whole ſex; then, all the ſex are ſlaves to vanity and ſelf-intereſt. In the gloomy paroxiſms of jealouſy, a rival appears in colours much leſs amiable in our ſight, than when our heart was free from that illiberal paſſion. How frequently does terror conceal the object which cauſed our fears!

A man, when agitated by any paſſion, ſees not objects, or if he ſees them, it is not in the ſame light as when he was free from their influence; but what is moſt ſingular, in the ſame paſſion, we always ſee objects in the ſame manner. Does the ſoul overflow with joy? We find charms unknown before in every object near us; they change their nature in our eyes, and become more pleaſing and more beautiful than before.

The garden where the diſgraced courtier endeavoured to forget his cares, on receiving the news of his recal, ſeems the haunt of ſome beneficent being, who has drawn aſide the veil, which before concealed its beauties from his ſight; the flowers appear of a richer hue, their forms ſeem more agreeable, and their odours more delicious; the air is embalmed, an univerſal change ſucceeds, and all is full of grace and beauty.

Is the ſoul affected with ſadneſs? Nature is covered with a gloomy veil; its deformity is enhanced, and all its beauty fades.

Whatever ſentiment may affect us, the cozenage of the paſſions always ſubſiſts, the face of nature is perpetually changing in our eyes. If we love, the object of our paſſion acquires additional charms. Obſerve an ardent lover, let the perſon of his miſtreſs be ever ſo homely, every part is beautiful, charming, divine! The black is a ſprightly brunette. The gigantic a majeſtic; the meagre a delicate beauty. And if his paſſion be extreme, this homely, ly, brown, gaunt, meager creature, ceaſes to be a woman; ſhe becomes an angel.

When hatred on the contrary takes poſſeſſion of the heart, the object of our indignation becomes diſagreeable; and our enemy, whatever merit he poſſeſſes, is then ill favoured and odious. And even the objects formerly our delight are altered and diſfigured by it. When the ſlighted lover, who imagined his miſtreſs an angel while his affection continued in its force, ceaſes to love, the illuſion inſtantly vaniſhes, and the ſight of the lovely face, which before excited ſo many pleaſing emotions, now produces a very oppoſite effect: his mind being reſtored to its former ſtate, views with aſtoniſhment the former object of his love, and is ſurprized how he could fix his affections on ſuch features. He aſks himſelf how he could poſſibly admire her; and all thoſe bewitching charms, all thoſe heavenly graces are either not ſeen, or ſeen with indifference. But if hatred ſucceeds, the object changes yet more, the few beauties that remained are obſcured, elegance becomes deformity, and by a kind of prodigy, hatred degrades an object as much as love exalts it. Such in general are the deluſions of the paſſions; were I to repeat their many ſpecies, I ſhould never have done.

The proſpect of nature ever varies with the paſſion, and always in the ſame proportion: if this change gradually, that alſo varies inſenſibly; if this change is inſtantaneous, the other is altered with the ſwiftneſs of lightning. Thus the ſentiment we are poſſeſſed with, conſtantly changes the face of nature; like a magician, paſſion extends its deluſive enchantments to every object, and never ſuffers us to view them but through a falſe perſpective. Whence ariſes this phenomenon? And what is this hidden charm, which the paſſions ſpread over all nature? Wherefore does love embelliſh, and hatred disfigure its objects?

Of the authors who have attempted to account for theſe phenomena, ſome attribute it to the imagination; others to the ſenſes.

The former ſay, "That in love, for "inſtance, the imagination repreſents to "us thoſe images which are analogous to "the ſentiment in the mind; that the "paſſionate lover, while his paſſion con-

“ tinues, ſees not in his miſtreſs her true “ image, but a creature of the fancy, and “ takes the beauty, which he himſelf “ ſtamps thereon, to be really that of the “ object.” But if we carefully examine what paſſes in our minds at that time, we ſhall be convinced, that this illuſion is not the effect of the cauſe to which it is here attributed; and ſhould this internal feeling not convince us, it would be very eaſy to ſatisfy ourſelves thereof, by examining facts.

The colourings which the paſſions communicate to objects, always change as the paſſions: if the paſſion changes by degrees, theſe colourings vary inſenſibly: if the paſſions are inſtantaneouſly altered, the colourings change with equal rapidity. The ſame cauſe which produced the illuſion in this latter caſe, is that which produced it in all the other caſes. It is therefore clear, that in this ſudden change, the illuſion is not the effect of imagination, ſince no idea has entered the ſoul whilſt the change is making; the underſtanding has not even time to act, nor the imagination to form any picture.

They who attribute theſe phenomena to an alteration in the ſenſes, occaſioned by the emotions of the mind, reſt on no better grounds; for objects continue always the ſame, they in like manner always produce on our organs ſimilar impreſſions, and theſe impreſſions are communicated to the ſoul always in the ſame manner. Neither do the ſenſes undergo any change, and their organic conſtitution is always the ſame. It is therefore evident, that theſe phenomena neither have their cauſe in the organ which receives this impreſſion, nor in the organ which propagates it; but only in the ſoul which receives it.

The colourings, which the ſame paſſion communicates to objects, are always the ſame in all caſes; and whether the paſſion change by imperceptible degrees or inſtantaneouſly, the colourings change in the ſame manner; the paſſion and the illuſion decay one after the other by the ſame gradations. Hence, ſince objects are ever the ſame, and ſince the ſame object changes with the ſentiment in the mind, theſe phenomena are to be imputed to the paſſion only. It is love only, therefore, which decks out the idol of our hearts, and lends it its charms without our perceiving it.

But what is the cauſe of this deceitful charm, which paſſion communicates to objects? If we attentively conſider the matter, we ſhall diſcover the ſimple and evident cauſe of this ſurpriſing phenomenon to be in the ſentiment we then entertain.

It is evident, that the ſoul ſees not external objects out of the body; it does not even ſee them in the organs of the ſenſes, but in itſelf; and there the proſpect of nature is ſeen *.

Whatever ſentiment affects the mind, the illuſion of the paſſions almoſt continually embelliſhes or deforms objects, and increaſes or diminiſhes their impreſſions. On the other hand, the impreſſions of objects are confined to the producing agreeable or painful ſenſations † of dif-

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* See Book I. Art. of the body, conſidered as the general organ of ſenſe and motion.

† The ſame may be ſaid with regard to the ideas of objects: all theſe relations or attributes *fine*, *good*, *pretty*, *amiable*, *charming*, *noble*, *heroic*, *ugly*, *frightful*, *mean*,

ferent kinds, all of them in different degrees, but for ever retaining theſe two characteriſtics. Theſe ſenſations are continually exciting in the ſoul; the one, ſentiments of joy, the other, ſentiments of grief.

Thus the ſentiment which poſſeſſes the ſoul whilſt under the influence of any paſſion, and that which ariſes from the impreſſion of objects, being analogous, the ſentiment reſulting from their union muſt be ſtronger than either of them ſingly, and ſtronger in proportion to the ſtrength of the paſſion, and to the number of analogous ſenſations. But obſerve, that in every new ſenſation, this compound ſentiment is wholly felt, and the ſoul then ſuppoſes it to be the effect of a ſimple ſenſation: the underſtanding, ſuppoſing that to be a particular effect, which is the effect of ſeveral cauſes, attributes to the impreſſion of objects that which ſhould only be attributed to the diſpoſi-

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mean, *wicked*, are only ſo many agreeable or diſagreeable ideas. A lover thinks no woman handſome or amiable, but as ſhe reſembles his miſtreſs; this conformity is the moſt agreeable quality another can poſſeſs in his eſtimation.

tion of the ſoul. It is thus that paſſion embelliſhes, deforms, magnifies, and alters objects, and communicates its colourings to every thing in nature. Let us endeavour to render this truth more evident, by applying it to ſome example.

In every paſſion ſome ſtrong ſentiment prevails in the ſoul; in happy love, for inſtance, joy predominates. If, whilſt engroſſed by this pleaſing ſentiment, the ſoul be affected by any agreeable ſenſations beſides; the pleaſure ariſing from them, is always accompanied with the internal ſentiment which then occupies us; thus augmented, the pleaſure appears more ſtrong, and the ſenſations more agreeable. In the ſelf-ſame manner, joy, whilſt the ſoul is affected with love, communicates its pleaſing influence to the impreſſions of the ſenſes; thus too it embelliſhes its object, and lends it new charms. Hence in a ſtate of convaleſcence, the joy of having recovered a good we had loſt, gives the country a more pleaſing appearance, and renders the view of it more affecting, than when we are in health. The ſoul, for a long time oppreſſed by a violent diſeaſe, expands upon the return of health, and gives a looſe to the pleaſing proſpect of prolonged exiſtence; and hence ariſes that delightful ſentiment, which produces the agreeable emotion we then feel at the proſpect of nature *.

If the ſentiment, which predominates in the ſoul during the continuance of a paſſion, renders more ſtrong the impreſſion of thoſe objects, which are analogous to it, it muſt needs impair that of objects which are of a contrary kind. Hence it is, why in ſadneſs nature appears covered with a gloomy veil, and is leſs agreeable to the ſight. This is the cauſe why jealouſy diminiſhes the merit of a rival, and why hatred disfigures objects as much as love adorns them †.

Although the ſentiments, which proceed from the paſſions and ſenſations, be recipro-

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* This likewiſe is the cauſe why a favour, received from the hand of a tender friend, is more agreeable than when received from the hand of a ſtranger; and, in a word, why preſents receive ſuch additional value from the donor.

† Such likewiſe is the cauſe of thoſe frequent alterations in our appetite for different meats, odours, and modes, ſo erroneouſly attributed to habit.

cally impaired, when they are of an oppoſite nature, yet they do not deſtroy each other but when they are nearly of equal force; otherwiſe, the conteſt terminates always to the advantage of the ſtronger. Thus when hatred is weak, we allow our enemy ſome ſmall ſhare of merit, and likewiſe in ſlight pains, we ſometimes yield to the impulſe of pleaſure, and when grief is not exceſſive, a ſmile will ſometimes eſcape us.

Although the ſentiments, reſulting from paſſions and the impreſſions of external objects, be more lively when the paſſions and impreſſions are analogous, and weaker, when the reverſe; they are only ſo, when moderate; for when either is extremely violent, their reſpective ſentiment abſorbs all attention, and reigns alone in the ſoul. This is the cauſe of that blindneſs obſerved in perſons ſtrongly affected with any paſſion: and this is the reaſon why terror oftentimes conceals the object which occaſioned it; why joy makes no impreſſion on a ſoul overwhelmed with ſadneſs, and why grief finds no admittance into a heart which is always engroſſed by joy.

Paſſion frequently renders us blind, deaf, inſenſible, and objects continually receive their colourings from the diſpoſition of the ſoul; but there is ſomething yet more ſurprizing in the illuſion of the paſſions, for they can make us even ſee objects which do not exiſt. Fear ſometimes produces ſingular deceptions of the ſight: it is fear which repreſents to the credulous, the dead riſing from their tombs; which, to the benighted traveller, who wanders through ſolitary woods, transforms trees into men, ſets before his eyes, in the thickeſt darkneſs, ghoſts and goblins, and makes him imagine he hears the groans of perſons in the agonies of death.

In a fit of enthuſiaſm, they who are ſaid to be inſpired, at times, enjoy heavenly viſions, they converſe with houris and angels, whilſt a thouſand phantaſtic beings are ſeen by them as clearly as if they really exiſted.

This phenomenon has long perplexed philoſophers, nor have they ſucceeded better in their explanation of this, than of the preceding; they pretend, that "the "nervous fluid in this caſe commands

" the ſoul, and that, particularly in the " organ of ſight, it ſucceſſively takes all " the modifications, repreſentative of ob" jects by which it has formerly been af" fected." I would willingly know on what they built this ſtrange opinion. By what means are they aſſured that the fluid of the nerves communicates to the ſoul the image of objects, without the concurrence of the objects themſelves? Is not this a mere ſuppoſition? But theſe philoſophers diſcover the marvellous in things, which are in themſelves the moſt ſimple. This phenomenon, which is ſo ſingular when theſe viſions are taken for the effect of the impreſſions of the ſenſes on the ſoul, ceaſes to be ſo when we conſider that the proſpect of nature is in the ſoul. We muſt neither ſeek, out of ourſelves, nor in the organs of ſenſe, but in the ſoul itſelf, for thoſe monſtrous images, thoſe ſpectres, and phantoms, which the ancients fancied to be departed ſouls or ghoſts, eſcaped from *Acheron*, and which modern philoſophers look upon as ſenſations, reproduced on the ſenſes by the fluid of the nerves.

Whilſt preyed on by any violent paſſion we may, indeed, direct our ſight towards the objects which ſurround us, but we do not perceive them *, or rather we are altogether unconſcious of their impreſſions. Full of the preſent ſentiment, the ſoul is engroſſed by one object, and is inattentive to every other; it cannot then oppoſe truth to error, and illuſion is inevitable; for it is only by the attention we give to objects, that we can diſtinguiſh in the ſoul their real impreſſions from their images reproduced, which the underſtanding then preſents to us and aſſociates with them. This is the reaſon why, in extreme terror, man cannot compare his ſenſations with the objects which ſurround him, nor recollect the circumſtances, according to which his apprehenſions may be either real or imaginary. Incapable of conſidering whether theſe objects be real or only ideal, he takes the illuſory images which preſent themſelves to the mind for objects really exiſting. Thus ſleep lends to the phantaſms of a dream all the characteriſtics of reality: whilſt the ſenſes are at reſt, and attention is ſuſpended, the images of the objects

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* This happens in the catalepſy.

which have formerly affected us, are retraced in the mind, and that with ſo great exactneſs, that we frequently imagine we ſee and hear thoſe who have been long dead. In the ſame manner we fancy we ſee the ſun in his meridian luſtre, ſurrounded with thick darkneſs. And in the ſtill ſilence of the night we imagine we hear ſounds, and that we are tranſported to a different climate. Thus the lover believes he ſees the miſtreſs of his affections, that he hears her charming voice, and that he claſps her in his arms; ſometimes his dream changes, and the dear object of his deſires vaniſhes and deludes his eager embraces. And many times the ideal ſcene is ſo ſtrongly painted, that we undergo violent agitations, ſtretch out our arms, riſe from our beds, and purſue the empty viſions, till awaking, we recover our ſenſes, and are ſorry to find ourſelves undeceived.

Such are the true cauſes of thoſe ſingular phenomena which have baffled philoſophers, and which no one as yet has been able to account for.

Of the Exerciſe of the MEMORY.

The ſoul may be affected at the ſame time with many ſenſations, and never but with one idea; but what an immenſe number of ſenſations, ſentiments, and ideas, are retained at once in the memory!

As the memory is a merely paſſive faculty, all thoſe ſenſations, ideas, and ſentiments, which are depoſited in this magazine, are as if non-exiſtent, till the underſtanding preſent them to the mind. Without this intellectual power, the memory would be wholly uſeleſs, our thoughts being always effaced one by the other, the fruit of our experience would be loſt to us; and the paſt, for ever obliterated by the preſent, would be as if it had never been.

We can indeed chuſe the object we would depoſit in the memory, by applying the ſoul to it with attention; but we cannot modify any thing depoſited in the memory, nor exclude that which is once admitted there.

I have demonſtrated how this faculty, combined with ſenſibility, underſtanding and will, becomes *recollection* and *remem-*

brance; I ſhall not here repeat what I have ſaid elſewhere upon this ſubject, but confine myſelf to obſervations of a different kind.

The exerciſe of the memory depends on the underſtanding; theſe two faculties in this reſpect are ſubject to the ſame laws. It is only by the aid of ſome relations between the preſent ſenſations or ideas, and thoſe which are paſt, that the latter are retraced in the mind. In a delirium, in folly, in dreams, where all things appear unconnected, and diſordered, the renewing of our ſenſations or ideas is perfected only by the means of analogy, juſt as when we are awake, although their connection be not perceived; for whatever objects we recollect, they have always ſome relation to ſubſequent or preceding objects.

Senſations and ſentiments are always more active in the inſtant when we receive them, than when renewed by the memory; hence the ſtrength of the paſſions is augmented by the preſence of their object.

When Coriolanus, with an heart full of reſentment, marched againſt his country, no obſtacle could reſtrain him: threats and intreaties were in vain; he ſat down to beſiege Rome. The ſight of his native city, recalled the idea of the wrongs his fellow citizens had done him, and gave it new vigor: his fury was inflamed, ſo that he breathed nothing but revenge, and was on the point of carrying fire and ſword into the bowels of his country. Whilſt theſe emotions prevailed, his mother, wife, and children, preſented themſelves before him in tears; the ſight of theſe dear objects inſtantly awakened in his heart the ſentiments of tenderneſs, which before had given place to revenge; his firmneſs relented; all ſentiments of hatred became extinguiſhed, and the cruel pleaſure of revenge was ſucceeded by the love of his family, his friends, his country, and his Gods.

A thouſand other examples of this kind, equally convincing, might be adduced: the man who has long lived in adverſity, if fortune ſuddenly become propitious, on hearing the happy change in his condition, can hardly reſtrain his joy; and during all the while that he is detained from the poſſeſſion of his treaſure, his imagination is continually occupied with the pleaſures he promiſes himſelf; he enjoys no reſt, no quiet: obſerve how his eyes gliſten at the ſight of the ſacred metal; tranſported with joy, the emotions affecting him can no longer be confined within the ſoul; but notwithſtanding all his efforts to ſuppreſs them, they break out in quick and ſudden motions.

In like manner, in a criminal condemned to die, fear continually increaſes his terror, gathers ſtrength as the hours elapſe, and the fatal inſtant approaches: brought to the place where he is to ſuffer, he ſhakes with horror at the ſight of what he is to undergo, his blood congeals in the veſſels, and his ſtrength fails him with exceſs of fear.

The paſſions derive additional force from the preſence of their object. It is by a conſequence of this law that ſo many projects expire in their birth, that ſo many ſecret reſolutions prove abortive, and that we refrain from all freedom of diſcourſe when the tyrant appears. It is this law which augments the trouble of a guilty mind, as well as the inward ſatisfaction of a truly penitent heart, as they approach the great day of account.

Hence the impreſſions of objects, which are ſo ſtrong when firſt received, being tranſmitted to the memory, gradually decay in proportion to the interval between the time when they are firſt received, and that when they are recollected. Time, which deſtroys every thing, ſeems to exerciſe the ſame power on our ſouls: our ſenſations, ſentiments, ideas, like characters engraven on marble, gradually wear out, and at laſt are wholly obliterated.

Of the Exerciſe of the WILL.

We can fix our ſenſibility on any object; we can ſelect thoſe we will to depoſit in the memory, and apply the underſtanding to the conſideration of any of theſe at pleaſure: theſe faculties of the ſoul are therefore in this reſpect dependent on the will.

The ſame laws appear in the regular exerciſe of the faculties which are obſerved in the voluntary and mechanic motions of the body; the ſoul can employ them in any determinate deſign, can attend at pleaſure to any particular object of its choice, and requires only a ſimple determination of the will to continue this attention. Senſibility, memory and underſtanding, in certain reſpects are dependent on the will, but this in its turn is alſo ſubject to ſenſibility. Examine the will in any relation you pleaſe, you will ever find it to be directed by ſentiment, by the love of pleaſure and averſion to pain, even when it appears to ſeek this, and to renounce the other.

The love of happineſs, is what makes the unfortunate feel the vanity of this life, arms his hand with the inſtrument of fury, and turns it againſt himſelf. The ſame cauſe excites the fanatic and devotee to faſtings, mortifications and ſelf-denial of every kind : from this proceeds that holy rage, which makes them ſhed their own blood, and expire in the agonies of ſelf-inflicted torments.

All our faculties are therefore differently connected, the one with the other. Senſibility, always ſubject to the impreſſion of external objects, is ſometimes influenced by the will. Memory has for its baſis the ſenſations and ideas, and never appears without the aid of ſenſibility and of the underſtanding. The underſtanding continually requires the concurrence of ſenſibility, of memory, and frequently of the will. The will likewiſe is itſelf ſubject to ſentiment. Such is the connexion of our intellectual faculties, a moſt admirable connexion, whereby theſe different powers unite in the ſame operations, in a manner ſo gentle, ſo imperceptible, as to require a conſiderable degree of ingenuity to perceive it.

Particular OBSERVATIONS *on the* SENSATIONS.

I have obſerved, that there may be many moderate ſenſations in the ſoul at one time, but never more than one extremely powerful ſenſation. The force of the latter muſt therefore be much greater than the force of the others combined. This is not becauſe their multiplicity impairs the ſenſitive principle, and that they really acquire force, in proportion as their number is diminiſhed; but becauſe a very ſtrong ſenſation occupies the whole ſoul, and wholly engages its attention; at that time the others are of no effect; they undoubtedly are tranſmitted to the ſoul, but are no longer admiſſible there. Hence the leſs ſenſibility is divided between different ſenſations, the greater is the force of each particular ſenſation. The ſenſations, therefore, muſt be unconnected, to retain their full power.

It is not ſo with the ſentiments of joy and ſadneſs, which are produced in the ſoul by theſe ſenſations. In the concurrence of analogous ſenſations, which together affect the ſoul, their union produces the moſt powerful effects; for the ſecond object which the ſoul diſcovers, adds to the pleaſure produced by the firſt, and this pleaſure is yet farther increaſed, by the charms of the next new object which ſucceeds it. The more theſe ſenſations are multiplied, the ſentiment formed from their combination muſt be the more ſtrong, the ſoul being at once affected in many different parts.

A tempeſt ſtrikes the ſpectator with horror, but this horror is much increaſed, if the atmoſphere appear on fire, if the winds are in their fury, and peals of thunder ſhake heaven's concave.

The proſpect of a fine country, illumined by the ſetting ſun, and gilded with his departing rays in the evening of a ſerene day, imparts joy to the ſoul; the coolneſs of the air, the delightful melody of birds, the murmurs of ſome gentle ſtream, the odours of flowers and eaſy motion of the fanning zephyrs, enhance the pleaſure of the ſcene, and wholly engage the heart.

In the pleaſing, as in the terrible, the concurrence of analogous ſenſations compoſe all that is great and magnificent in the ſcene, and the irregular aſſemblage of pleaſing and frightful objects, together with the variegation of the whole, forms an engaging proſpect, which charms the heart or terrifies the ſoul by means of the ſenſes.

We have ſeen that different ſenſations muſt be unconnected to produce their full effect; but by a ſingular phenomenon, the united force of the analogous ſenſations, which affect the ſoul at the ſame time, is incomparably greater, than that of the ſame ſenſations when they act ſingly. In the inchanting proſpect of a fine landſcape at ſun-riſing, not only every new object, every new ſenſation, adds to the pleaſure produced by the others; but what is more to be admired, every ſenſation becomes more intenſe, and every object is embelliſhed with the charms of that which ſucceeds it; the odours of flowers renders their colour more agreeable, and the ſweet breath of zephyr adds harmony to the warbling of the birds. Each of theſe ſenſations therefore acquire force by their union and mutual concurrence. The cauſe of this phenomenon is very ſimple; for to the pleaſure produced by one, is united that of the others. The ſentiment of pleaſure, formed from theſe particular ſentiments, muſt then be more powerful, and the impreſſion of the ſenſation more efficacious, as I have proved elſewhere. Analogous ſenſations therefore gain by their union, as much as contrary ſenſations loſe thereby. Hence the reaſon why wine is more pleaſing, if, beſides its flavour, it be of a brilliant colour, and yet more agreeable, if drank out of a veſſel of chryſtal than if out of a veſſel of ſtone. This is the cauſe why, in thoſe places of public entertainment where people go to kill time, the want of proper decorations renders the performance leſs intereſting; and why a dreſs, which has been long in wear, degrades the merit of an actor, and leſſens the enjoyment ariſing from the repreſentation.

Of the Force of the PASSIONS.

The ſource of every paſſion is the love of ſelf, and this ſentiment is of equal force in every individual; for nothing can be conceived ſuperior to that love which every one entertains for himſelf: this ſentiment has likewiſe the ſame degree of force in every individual; as Man never prefers another to himſelf. The paſſions, however, are not of equal force in every perſon; as they derive not their power from their ſource, but from ſenſibility; by which both pleaſure and pain is eſtimated. If it be a law of nature to love that which is beneficial, and to hate that which is hurtful to us, it is likewiſe a law of nature to love or hate objects, in proportion to the good or ill they do us. The force of the paſſions is then proportionate, in every individual, to his ſenſibility; but that is not the only cauſe of their difference; their force varies likewiſe with the nature of their objects.

Every paſſion is a conſuming fire which carries its heat into the ſoul, and animates it with new vigour; but all the energy and power of the ſoul is owing to the artificial paſſions only. That voluptuous emotion which renders one ſex neceſſary to the other, is gentle * and moderate in the ſtate of nature, that is, when imagination is excluded; the luſtful ardour, which renders that harmleſs animal, the ſtag, furious, is not perceived in Man. Is the body over-charged with prolific fluid? Man feels the impulſe of nature, and yields to its ſuggeſtions with delight, but is never furious. It is only, when conſiderations of a kind entirely different from his phyſical conſtruction happen to be added to this impulſe, and when the imagination, finding in the object thoſe ideas of beauty and merit which are of our own creating, magnifies the allurements thereof, makes us believe our ſovereign

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* Let us not confound love in the ſtate of nature, with that artificial love wherein the ſenſes are inflamed by the imagination, although the heart be not determined excluſively towards any particular object.

good depends on the poſſeſſion of it, and by this means turns the gentle ſentiment of love into an immoderate paſſion. Like a devouring fire, it inceſſantly preys on him who is inſpired with it, and makes him endure all ſorts of hardſhips, encounter every danger, and even ſpill his blood for its gratification: ſo that this terrible paſſion, when in its fury, ſeems rather calculated to deſtroy, than to preſerve the human ſpecies.

The other ſenſual paſſions are not more violent than love, in the ſtate of nature; as they may then eaſily be curbed, they put us to little trouble for their gratification *: whilſt the moſt aſtoniſhing effects have been produced by the artificial paſſions in all ages. It was the love of glory, which

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[*] Neither let us confound the fear of death, which ever accompanies the want of aliments, with the pleaſure of ſatisfying hunger. This pleaſure could not induce a man to ſuffer the ſlighteſt pain, or expoſe himſelf to the leaſt danger; the fear of death, on the contrary, expoſes him frequently to a thouſand dangers with a view to avoid it. In any public calamity, as in a ſiege where famine prevails, there is nothing the beſieged would not freely give to procure bread; they would even be happy to purchaſe it at the price of all they have in the world.

which produced thoſe ancient heroes, whoſe actions ſo greatly aſtoniſh us, *Alexander*, *Cæſar*, *Gengiſcan*. It was the love of glory that made thoſe yet more wonderful men, *Thales*, *Zeno*, *Socrates*, ſacrifice all the pleaſures of life, and paſs their days in the painful exerciſe of the moſt auſtere duties, continually exerciſing their ſouls by ſelf-denial, thus keeping them always prepared for the ſtrokes of adverſe fortune.

It was the *Amor Patriæ*, that inſtigated the *Decii*, the *Curii*, the *Poſthumii*, to devote themſelves for its preſervation. It was this love which prompted the pacific and juſt *Ariſtides*, to a very uncommon inſtance of moderation; made him reſpect the liberty of his ungrateful country-men, when it was in his power to have enſlaved them, and be contented with the condition of a private citizen, when he might have been maſter of the commonwealth; for this, he continually governed himſelf by the laws of rigid virtue, and preſerved, through the courſe of his life, a mind unſullied by the conſciouſneſs of an ill action. To the ſame love is to be attributed the incorruptible virtue of *Cato*, that image of the gods, declared enemy of tyranny, and guardian of his country, who undertook the cauſe of expiring liberty after the death of *Pompey*, revived the drooping ſpirits of the people, made them take up arms, applied to the remoteſt parts for aſſiſtance, traverſed frightful deſerts, deſpiſing danger, fatigue, ſingly ſupporting the whole burden of a civil war, not to purchaſe a kingdom, but from his ruling paſſion, the ſource of all his actions, the love of his country and of liberty, ever regardleſs of his own intereſt, and watchful for that of the public. Yet this invincible ſpirit fell a victim to grief, when he perceived his efforts to be vain, and when he found grief too ſlow to deſtroy him, had recourſe to his ſword, ſtabbed himſelf, and tore out his bowels, that he might not be the ſad witneſs of his country's ſlavery.

The artificial paſſions produced all thoſe great actions, whoſe ſplendor dazzles our imperfect ſight, and all thoſe great perſonages, whoſe aſtoniſhing actions appear fabulous to us, in theſe times when virtue is no longer in its ancient eſteem.

Of

Of the Combination of the PASSIONS.

Every paſſion is founded on the love of pleaſure, and hatred of pain, two ſentiments which are common to all men; the ſame ſoul is therefore ſuſceptible of every paſſion indiſcriminately, yet they all cannot prevail in it at once, and ſome paſſions exclude others, and *vice verſa*: thus avarice excludes love of pomp, as the love of glory excludes that of reſt.

There is never more than one paſſion predominant in the ſoul, at the ſame time, though it is frequently diſtracted by many different paſſions: but the greater the number of theſe paſſions is[*], the leſs is the force of any particular one. Not that the ſenſibility of the ſoul is divided by their multiplicity, for each one, acting ſeparately, occupies the ſoul entire; but as theſe paſſions act in ſucceſſion, no one of them has time to make any ſtrong impreſſion thereon. It is the imagination which adorns the idol of our hearts, and is continually ſetting it off with new charms; by degrees its beauties are improved to ſuch a degree, as to dazzle and bewitch the mind, and we fooliſhly adore the work of our own hands, pant after the poſſeſſion of this phantom, and waſte a conſiderable part of life in the purſuit of it.

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[*] This muſt be underſtood of the artificial paſſions only.

Deſire is formed in the ſoul, as ſoon as the underſtanding has perceived the relations between the poſſeſſion of an object and our happineſs; but it decays not immediately after its formation; it even continues a while, without diſordering the ordinary courſe of our thoughts.

Our deſires are reciprocally combined in different manners, according to their analogy and diverſity. The paſſions, which reſult from objects which are unconnected, act in ſucceſſion; the mind paſſes from one to another, however imperceptible this tranſition may be, and is then divided between contrary emotions, ſo that this action is weakened thereby.

Of this nature is the pain a lover feels, on quitting his miſtreſs to join the army and engage in war: ſuch as the poet repreſents the departure of *Achilles* from *Deidamia*, to the ſiege of *Troy:* agitated by contrary emotions, his ſoul long wavers betwixt love and glory; he goes at laſt, but not without grief, and in a manner which evidently demonſtrates his irreſolution.

Contrary paſſions ariſing in the mind reciprocally weaken each other. Thus in queſtions about matters incapable of demonſtration, and merely probable, the certainty of the mind is leſs when the underſtanding is divided by contrary ideas. But in the ſucceſſion of analogous paſſions, the ſucceeding ſentiment acts in concurrence with that which is already acting on the heart, and their united force communicates a double impreſſion to the ſoul.

Whilſt Rome, yet free, could boaſt ſhe had within her walls citizens, who had enriched themſelves with the ſpoils of vanquiſhed nations, the love of liberty and glory, together with the deſire of preſerving the wealth they had acquired, was the ſource of the ſuperior courage of that people *.

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* When the profeſſion of a ſoldier was the excluſive right of a common citizen, the rich ſoldiers always diſtinguiſhed themſelves the moſt, as the dangers they were obliged to undergo were greater than that of others: in a word, the riſk of life was common, that of goods particular.

What a triumph for a young Spartan to be at once the object of public honours, and of the deſires of beauty! How irreſiſtible the love of glory (that powerful and delicate ſentiment, which unites the love of grandeur and ſublimity, with all the energy of pride) when increaſed by the allurements of pleaſure.

The force of the paſſions, ever proportionate to the degree of ſenſibility, is therefore increaſed by the union of analogous paſſions, and the more ſo, in proportion to the number of thoſe ſentiments which are collected into one. Thus a torrent, whoſe waters flow with a gentle motion, whilſt divided into many ſtreams, when united in the ſame channel, ruſhes with the greateſt impetuoſity; ſo that neither dams, nor rocks, nor banks, can ſtop its fury.

Of the Duration of the PASSIONS.

If we diſtinguiſh the emotions of the ſoul by their duration, we ſhall find, that all the ſenſual paſſions are of a momentary nature, and, on the contrary, all the artificial paſſions laſting.

When love is no more than the voluptuous emotion which inclines one ſex to the other, it is periodical, and is felt only when the body is overcharged with prolific fluid: Man therefore waits the impulſe of nature ere he reſigns himſelf thereto; his want ſatisfied, he has no longer deſire, and love is extinct. The duration of pleaſure can only ſubſiſt in the imagination, not in the ſenſes, however ardent thoſe of lovers may be. During their ſhort delirium, their greedy eyes, and impatient hands, know not which charm to ſelect; in the moment of enjoyment they eagerly claſp the object of their deſires, and in an univerſal tremor, impreſs the moſt paſſionate kiſſes: at the approach of that delicious ſenſation, the ſummit of pleaſure, their tranſports, how greatly increaſed! Their embraces how furious! Over-powered with exceſſive pleaſure, their ſouls meet on their eager lips, and preſs each other, as if they would grow together. But the moment the prolific fluid is ejected, the fire which before conſumed them is extinguiſhed, until, recalled to pleaſure by new deſires, again they kindle, again love overwhelms the ſoul: after a few paroxyſms of this paradiſaic delirium, and a few moments enjoyed in fluttering from flower to flower, a frigid languor ſucceeds, and the happy pair, now without paſſion and without deſires, ſigh for repoſe, and are eager to part.

How different is the caſe when the imagination lends charms to love! When the beauties of the beloved object are exaggerated in the lover's eyes; when imagination repreſents his miſtreſs as the perfect model of every excellence, and holds forth to his eyes his whole and only felicity as centered in the poſſeſſion of her. Then only the lover becomes an enthuſiaſt, and a flame is lighted up within him, which continues unextinguiſhed for years. When at length he has enjoyed the object of his deſires, the tender emotions of his heart continue after enjoyment, the charm remains when the delirium of the ſenſes is no more. Refined charm! Delightful ſentiment! Begotten by admiration, and foſtered by eſteem and reſpect; it forms a chain which time cannot diſſolve.

When cruel deſtiny has deprived a tender miſtreſs of her lover, her wounded heart demands him from heaven; in the exceſs of her grief, ſhe attaches herſelf to his ſhade, moiſtens his cold aſhes with her tears, and preſſes to her ſad boſom, the urn in which they are incloſed.

The duration of the paſſions is likewiſe relative to their degree of force; for the ſucceſſion of ſentiments is ever in proportion to their vivacity, as is that of phyſical ſenſations. This is evident from the predominant paſſion, that furious deſpot which reigns uncontrouled in the ſoul, where he keeps the ſway for years, and even till the body drops into the grave.

Of the Life of the SOUL.

Deprive Man of the deſire of happineſs, of the love of pleaſure, and of averſion to pain; he is eaſy in the preſent moment, unconcerned for the future and devoid of care: he will neither take the trouble to think nor reflect, and having no intereſt to prompt him, will continue inactive, and his ſoul ſink into a lethargic indolence. The paſſions are the life of the ſoul, and the ſoul of the moral world, impart motion to our faculties, and give activity to every ſenſible being. It is averſion to pain that rouſes animals from their repoſe, and prompts them to ſeek for food; the horſe, the green herb, and Man his prey. It is love of pleaſure that excites every animal to delight in the ſociety of his own ſpecies, that impels the ſexes to ſeek each other, and unite in nature's myſtic rites. The love of gold tempts Man to expoſe himſelf to the fury of the waves, makes him venture acroſs oceans, and is the incentive which urges him to continual toils. The love of glory warms the heart of the philoſopher and hero, prompts them to conſume life, the one, in the ſearch of wiſdom, the other, in the toilſome exerciſe of virtue. The thirſt of fame, ambition, avarice, fear, love, hatred, or all the paſſions united, intice men to take arms, inflame them with mad fury, rouſe them to battle, till ruſhing on each other, ſword in hand, the earth is ſtrewed with dead bodies, and the fields are glutted with ſlaughter.

Like an impetuous wind, the paſſions raiſe their voice, impel man to action, and inceſſantly urge him to buſtle, in ſpite of all thoſe allurements of a quiet and pacific life, which would have kept him inactive.

Abſurd Opinion of Philoſophers on the Force of the SOUL.

The life of the ſoul conſiſts in its being animated with the paſſions; the force of the ſoul conſiſts in reſtraining and ſubduing them to reaſon: but in what manner does the ſoul govern them? Hear what the philoſophers ſay, "Two principles "prevail in Man; the paſſions to rouſe, "and reaſon to controul him: this go-"verns, that animates him; the paſſions "impel the ſoul to action; reaſon directs "it and reſtrains them; by this the paſ-"ſions are curbed, and the ſoul preſides." Vain declamation! Let us leave theſe philoſophers to make paſſions and reaſon two contrary principles, and ſuppoſe them as oppoſite in their natures as they pleaſe, they will never be able to make calm reaſon a counterpoiſe to impetuous deſire and ſtrong ſentiment.

To conquer a paſſion, nay, even to will it, the ſoul muſt conſider and examine the reaſons why it is to act in this manner, and why it ought to refrain from acting; it muſt ſhew the ſuperior advantage of reſt to action; but as the impulſes of ſentiment are rapid, ſo the arguments which reaſon ſuggeſts proceed but ſlowly, and the paſſions have already determined Man, before he can deliberate on what he ought to do. For the paſſions feel the preſent good; and reaſon only foreſees in the conſequences of things, the good which is to come: the objects of the paſſions ſtrongly affect us, as being preſent to the ſight; whilſt thoſe of reaſon are impaired by their remoteneſs, and always yield to the impreſſions of the paſſions.

O reaſon! thou boaſted recourſe of the wiſe, how can thy feeble voice prevail againſt the violence of the paſſions? What effect can it produce on a ſoul in diſpair, or overpowered by the fury of the ſenſes? Since the aſſiſtance thou giveſt appears ſo little efficacious, allow me to doubt, whether at that time, thou art capable of adminiſtering any.

When affected with the tumultuous paſſions, the ſoul does not reflect, nor can the voice of reaſon be heard *: like a pilot in a veſſel that has loſt its anchor, and is toſſed at the pleaſure of the winds; overcome by the fury of the tempeſt, he quits the

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* See Art. on the exerciſe of the underſtanding. Book 2, pag. 201.

the helm and lets it drive, and is himſelf an uſeleſs incumbrance in the veſſel which he can no longer govern.

Such is the boaſted power of reaſon! How vain then is wiſdom, ſince it leaves Man defenceleſs in the time of danger, and only affords him aſſiſtance when it is not wanted!

In the impetuous paſſions, the ſoul, unable to make any oppoſition, gives way to their violence, calm reaſon is ſilent; or, if it retain any ſmall ſhare of activity, it ſerves only to render them yet more ungovernable. Wholly intent on ſome preſent enjoyment, like the predominant ſentiment, it is ſeduced by the allurements of voluptuouſneſs, and acts in concert with it, in purſuing the ſame object. A paſſive ſlave during the tempeſt, no ſooner is it ſubſided, when, inſtead of adminiſtering comfort in our misfortune, it joins with the ſenſe of our unhappineſs, and aſſiſts it in depreſſing the heart. An helpleſs friend in danger, it abandons us in our neceſſity, goes over to the enemy, and returns not till after we have ſuccumbed, and then only, to add to our confuſion. Thus ever applauding or cenſuring, when it is too late, it can only ſerve to give its ſanction to our errors *, or to puniſh us, when we have committed them, with an uſeleſs remorſe. Thus the ſoul, having no defence againſt the paſſions, is carried away by their violence, and Man is neceſſitated to ſurrender to ſentiment. The empire of reaſon therefore conſiſts altogether in our having no paſſions either to repreſs or ſubdue.

To how little an extent is this power of the ſoul reduced! How trivial this prerogative, in the enjoyment of which philoſophers have ſo greatly exulted!

A right Judgment of the Force of the Soul.

In the courſe of human life, wherein Man is ſo variouſly affected, the paſſions are the only principle of his actions; but it is not action which conſtitutes the force of the ſoul, it is the reſiſtance which the ſoul oppoſes to the paſſions.

Who then can properly be ſaid to be endowed with force of ſoul? Not a boiſterous *Achilles*, regardleſs of every danger; not an ambitious *Alexander*, who laid waſte the globe with fire and ſword; not an auſtere *Cato*, who tore out his bowels with his own hands*: as they were alike unable to withſtand their paſſions, ſo they all fell victims to them; the firſt, to his ambition, the ſecond, to voluptuouſneſs, and the laſt, to grief. The man who deſpiſes pleaſure and pain, faces danger without fear, receives, with indifference, the ſtrokes of adverſe fortune, and ſuſtains them with an eaſy firmneſs, He, in my opinion, is truly endowed with force of ſoul. In morals as in phyſics, force is diſtinguiſhed into active and paſſive; but let us diſtinguiſh ever ſo often the faculties of the ſoul from each other, and the ſoul itſelf from its faculties, we ſhall never perceive any thing like theſe two kinds of power in Man; we may, indeed, perceive an active power, viz. ſentiment, but never any counterpoiſe. Not that it is impoſſible to reſtrain the impetuoſity of the paſſions; this may be done, doubtleſs, by oppoſing the one againſt the other, that is, by ſubjecting the ſoul to many, in order to deliver it from the tyranny of one. Man, therefore, being thus the feeble ſport of his paſſions, is continually neceſſitated to ſubmit to their tyranny; juſt as a ſlave, condemned to perpetual ſervitude, is ever changing his maſters, and has it not even in his power to chuſe what tyrant he will ſerve.

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* See Book 2. pag. 223. Art. Some ſingular phenomena explained, concerning the effects of the paſſions on the underſtanding; and the Art. Natural ſucceſſion of thoughts. p. 210.

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* Every perſon committing ſuicide, deſires only to avoid the ſight of his miſeries, which he cannot endure with patience: death is not an object of fear to him; it is life only which he dreads.

Let us then conclude, that if the force of the ſoul conſiſts in commanding our paſſions, none can, properly ſpeaking, be ſaid to be endued therewith: whatever has been advanced on that head is abſurd; for to deſtroy the empire of the paſſions, we muſt deſtroy ſenſibility itſelf.

Of the feigned Force of the SOUL.

"Were not *Socrates*, who calmly drank "the poiſoned bowl; *Seneca*, who ex"pired in the bath, converſing with his "friends; *Zeno*, who overcame both plea"ſure and pain, and denied himſelf every "thing which might enervate the ſoul, "endued with this force of the ſoul?" Do you imagine theſe ſages did not act under a maſk? Do you think that *Socrates* or *Seneca* met death without apprehenſion? From the bitter reproaches which one of them uttered againſt the tyrant, who had commanded his execution, is it not evident, that he yielded unwillingly to his deſtiny? And even, if the other had not demeaned himſelf ſo as to plead his cauſe, and if his ſoul, prepared by the continual exerciſe of wiſdom, had not given that mark of timidity, who can allow himſelf to believe, that *Socrates* did not act a borrowed part? In vain he endeavoured to conceal his inward feelings, under an air of ſerenity, and an unfaultering voice; the ſoul trembled within him, and his trouble muſt have appeared, notwithſtanding this vain diſguiſe, to a diſcerning ſpectator. The proſpect of a painful death will always ſtrike terror; none can view it without ſhrinking: the wretch who, overwhelmed in deſpair, has reſolved to take away his own life, and calls on death to help him to ſtrike the blow, heſitates; his arm, though lifted up, refuſes to ſtrike, and he is forced to inflame his reſolution with the recollection of his miſery, till ſummoning all his reſolution and deſpair itſelf, at laſt he perpetrates the deed, but not without turning his head aſide from an act which he dares not behold.

The force of the paſſions is proportionate to the degree of ſenſibility, and the degree of ſenſibility is only known by the force of the paſſions. When the heart is free from every connection, and all ſenſibility is centered in the mind, Man appears inſenſible; he can even believe himſelf to be ſo.

When the object of the paſſion affecting the ſoul is ſuch, that it may be enjoyed in ſilence, as that of pride, Man even then appears inſenſible; but it is to others only, for his ſenſibility is not unknown to himſelf. We cannot perceive the paſſions of others but by their exterior appearance, yet they exiſt not the leſs for their not being viſible. What would become of the principle of human actions, were Man diveſted of ſenſation and ſentiment? What motive taken from their own fund could tardy wiſdom or calm reaſon ſupply.

When Man has diſcovered the ſecret of reſtraining the paſſions, by making them act one againſt the other, and of forming them in battle array, and, as it were, front oppoſed to front, in the heart, he has found that of balancing the ſoul, preſerving it in an equilibrium, concealing his inward ſmart under a ſerene outſide, and imitating that true calm of the heart, which participates of the nature of inſenſibility; outwardly he appears tranquil, but trouble rages within. Thus *Camillus* concealed his reſentment; *Fabius*, his thirſt of fame; and *Decius*, the love of life under love of their country. Thus the auſtere ſtoic, tranſported with the love of glory, conceals, under an haughty indifference and diſdainful gravity, his love of pleaſure and averſion to pain.

It was not force of ſoul that prevented *Socrates* from revealing his trouble and venting his tears,—it was a noble pride. After ſo many paſt efforts, he muſt ſuſtain his character to the laſt, make a virtue of a neceſſity, and terminate victoriouſly a life of perpetual conflicts.

" The whole world have their eyes upon thee, be mindful of thy glory; thy " long life has been ſpent in making a " parade of bearing adverſity with firmneſs; down, down, my grief, deprive

" me not at my exit from life, of the " ſole reward of my conſtancy." Thus ſaid *Socrates* tacitly to himſelf, and would have ſpoken it aloud, had he dared.

Let Man do his utmoſt, in vain will he pretend to be exempt from fear, and from the yoke of the paſſions; he obeys them continually without perceiving it, even at the time when he is enjoying his imaginary triumph.

When *Diagenes* crowned himſelf with his own hands at the *Iſthmian* games, and proclaimed himſelf ſuperior to pleaſure and every human vanity, he was the ſlave of pride.

Let us then conclude, that the force of the ſoul is a merely apparent quality, is often even nothing but weakneſs under the maſk of ſtrength. Such is the nature of this ſo much boaſted and fallacious virtue, in which the ſhadow is often ſubſtituted for the ſubſtance, and the appearance, for the reality.

Man is perpetually the ſlave of his paſſions; however, all men are not under this univerſal ſervitude in an equal degree; their ſubjection is greater or leſs in proportion as the paſſions are more or leſs violent,

lent, as they are in a greater or leſs combination, and as theſe combinations are more or leſs ſtrong; for the force of the ſoul is in an inverſe proportion to ſenſibility. Heroes, who are celebrated for being endued with force of ſoul, are more the ſlaves of their paſſions, than the indolent and the fickle, who are agitated by the flux and reflux of opinion, conſtantly wavering between contrary impreſſions; their minds not having even the choice of their ſhackles, nor the power of changing them.

But what is more ſurpriſing, thoſe ſages ſo greatly renowned, and who pretend to poſſeſs this force of mind, are really the weakeſt of men. During the time they believe themſelves ſuperior to every paſſion, and are boaſting of their victory, they are ſubject to the moſt imperious maſters; for reaſon can never counterbalance one ſentiment but by its oppoſite, nor reſtrain one paſſion but by a ſtronger: that is, it muſt free the ſoul from one kind of ſervitude, by ſubjecting it to another yet more ſevere.

END OF THE FIRST VOLUME.

BRITISH MUSEUM 15 MAY 65

TO THE

READER.

THE Author not having had it in his power to ſuperintend the Preſs, begs the candid Reader will pardon, and, before he begins the peruſal of this work, correct the following errata in the text.

E R R A T A.

Page 1. Title, *for* Soul and the body, *read* Soul and Body,
viii, line 23, *f.* ſoul and the body, *r.* ſoul and body,
x, l. 15, dele the s in metaphyſicians,
xiii, l. 24, *f.* free-being, *r.* free being.
xviii, l. 15, *f.* writers beſt, *r.* beſt writers.
35, l. 20, *f.* climentary, *r.* elementary.
39, l. 3 and 4, *f.* this principle, *r.* theſe principles.
l. 10, *f.* extenal, *r.* external.
l. 11, *f.* this, *r.* their.
40, l. 3, dele may,
l. 21, *f.* conſtruction, *r.* contraction,
42, l. 12. *f.* eve- one, *r.* every one.
43, l. 12 and 13, dele itſelf,
45, l. ult. *f.* the heat, *r.* heat,
55, l. 21, *f.* vous, *r.* nervous.
56, l. 15, *f.* motions, *r.* motion.
69, l. 3, *f.* phenomena, *r.* phenomenon.
84, l. 9, *f.* an immediate, *r.* a mediate.
97, l. 1, *f.* motives, *r.* motions.
l. 3, *f.* as, *r.* are.
l. 16, for thoſe, *r.* theſe.
106, l. 20, *f.* the ſolid, *r.* of the ſolid.
110, l. 26, *f.* phenomena, *r.* phenomenon,
114, l. 2, *f.* it does, *r.* they do.
118, l. 11, *f.* fibrillæ, *r.* fibres.
l. 15, *f.* theſe fibrillæ, *r.* the fibres.
l. 26, *f.* original, *r.* organic.
134, l. 21, *f.* the head, *r.* from the head.
142, l. 16, for the human heart is, *r.* is the human heart.
l. 22, *f.* works, *r.* marks.
144, l. 25, *f.* and, *r.* live in.
146, l. 16, *f.* does, *r.* do.
146, l. 3, *f.* thoſe virtues, *r.* pity.
147, l. 12 and 13, *f.* proportion, *r.* manner,
151, l. 18, before *Heſperides*, *r.* the
160, note l. 7, *f.* by ſome, *r.* to ſome.
164, l. 6, *f.* endeavour, *r.* endeavours,
182, l. 22, dele which.
184, l. 14, *f.* occaſions. *r.* occaſion.
188. l. 2, before ſenſitive, inſert unfolding of the
199, l. 7, *f.* in, *r.* into.
214, l. 18, *f.* is, *r.* acts,
220, l. 11, *f.* are, *r.* appear.
224, l. 25, *f.* black, *r.* ſwarthy.
237, l. 5 and 6, after luſtre, *r.* though we are.
l. 15, *f.* deludes, *r.* eludes.
267, l. 22, *f.* in, *r.* with.
l. 27, *f.* reſolution, *r.* mind.
269, l. 22, *f.* a neceſſity, *r.* neceſſity.
270, l. 21, *f.* often, *r.* ever.

15 MAY 65